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LECTURES
ON
SCARLET FEVER.

BY
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CASPAR MORRIS, M. D.,

LATE LECTURER ON PRACTICAL MEDICINE IN THE PHILADELPHIA MEDICAL INSTITUTE,
FELLOW OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA,
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TO N. CHAPMAN, M. D.,

EMERITUS PROFESSOR OF THE THEORY AND PRACTICE OF MEDICINE AND CLINICAL
MEDICINE IN THE UNIVERSITY OF PENNSYLVANIA.

It is with emotions of no common character that I avail myself of the privilege you have accorded to my wishes, in dedicating this little volume to you as a token of the grateful recollection of a long and unbroken series of kind actions, which, commencing with the beginning of my professional life, has extended to the period at which, by your withdrawal from practice, you brought your own to a close. From your teachings, as well private as public, conjoined with those of my honored preceptor Dr. Joseph Parrish, I derived the power and encouragement to think freely on medical subjects; to your friendship I owe the opportunity for more extended observation than would have fallen to my lot without it; your counsel and assistance were ever at my service in all cases of emergency or doubt. Gladly do I recognise the obligation, thus created, and fain would I present a more worthy token of my sense of it, to cheer the eventide of your retirement. Delivered in a school which was founded by your wisdom and derived its high distinction under your fostering care, these lectures are a tribute in an especial manner due to you. Accept with it the assurance of the unabated respect and affection of

Yours truly,

CASPAR MORRIS.

P R E F A C E.

The following Lectures, on a subject which must always possess great interest for the Physician, were originally delivered to the class of the Philadelphia Medical Institute, and have been revised and committed to the press with the conviction that the views they express are true, and the practice founded on those views that which is the best adapted to the treatment of this formidable disease. The observations from which they have been derived have been made during more than twenty-five years' service in the Philadelphia Dispensary, the Philadelphia Orphan House, the House of Refuge for Juvenile Delinquents, and the Pennsylvania Institution for the Instruction of the Blind, as well as in the usual routine of family practice. During the progress of the publication in the successive numbers of the Medical Examiner, it has been a subject of regret that the form in which these views were issued prevented the presentation of tabular statements, and a more extended reference to the grounds on which assertions are made. Lectures must be dogmatic in their manner, in order to arrest attention, and impress the opinion of the teacher on the minds of the auditory; whilst didactic essays permit the free introduction of the processes by which the conclusions have been arrived at. Another difficulty has arisen from the necessity for reaching a pausing point in each successive number as it appeared. It has on this account been necessary to compress sentences and alter arrangement, as well as to adopt a division into lectures much shorter than those really delivered. Originally prepared under the pressure of engagements which fully occupied the usual hours of labor, they have been printed, and revised as they passed through the hands of the compositor, surrounded by the same causes of distraction. They are not sent forth as a perfect essay on Scarlet Fever, but as a sketch of the nature and treatment of that disease.

LECTURES
ON
SCARLET FEVER.

BY
CASPAR MORRIS, M. D.,

Late Lecturer on Practical Medicine in the Philadelphia Medical Institute.

LECTURE I.

Description of the Disease.

So fatal have been the results, so fearful the ravages, so wide spread the devastation of this disease, so interesting the period of life at which it commonly occurs, just as parental hopes are budding with promise, and the tendrils of affection entwining themselves the most closely round the heart, that the very name is a signal of distress, and its introduction into the family circle is looked upon as the entrance of the angel of death with an irretrievable warrant to destroy. The parent sits down in the evening the happy centre of a group of smiling objects of affection, his heart swelling with delightful anticipation as his eye glances around the circle; and ere the next return of the same weekly period, half of them slumber in the embrace of death. The

mother's nightly visit is paid to the couch of the only idol, upon whom her hopes are concentrated, and to which the sacrifice of anxious love is hourly offered, and leaves it sleeping tranquilly, no forecast shadow giving sign of the coming sorrow; the morning finds it stricken down by disease, and the evening an inanimate corpse given over to the power of corruption. These are no fancies, no exaggerated images of woe. There is not a practitioner of any extended experience but must acknowledge that he has not only witnessed such scenes, but been a miserable participator in their anxieties and grief. Of many such instances it may be said with truth, no skill could avert the result. Alas! of too many, that well meant but ill directed effort—to use the language of Sydenham, “*nimia diligentia medici*”—has hurried them needlessly to the tomb.

Nor is it by this rapidity of its course, alone, that scarlet fever is invested with its character of dread. Treacherous beyond all other diseases, cases apparently the least violent, “scarcely deserving the name of disease” in the earlier stages, not unfrequently develop lesions of the most formidable kind in their progress, and result in a fatal termination; while in others, a train of painful and disgusting sequela gradually exhaust the strength with long continued suffering, and entail consequences which remain for years, or even during life. It must be evident that such a disease demands the most careful investigation into its character, cause, and treatment.

I shall not detain you from the consideration of these by any discussion of the various names by which it has been called, nor of the propriety of the divisions which have been adopted by different authors. Objections may be brought against, and arguments adduced in favor of, most if not all these terms and divisions. A name it must have, and *Scarlet Fever* will answer as well as any that can be proposed; though you will find as we progress in the consideration of its symptoms, that some cases have little and others none of the peculiar eruption from which this term is derived. Divisions we must make in order to enable you to classify the cases, and arrange properly your ideas of its character and treatment; and the terms *simple*, *anginose*, and *malignant*, will embrace most cases, though I shall be obliged to notice others, which, not being reducible to either of these classes, though evidently derived from the same origin, I shall designate

as *irregular*. Never, however, allow yourselves to forget that these are but various phases of one disease, which fall into each other by imperceptible shades; so that while the cases which may be assumed as types of each class have strong marks of distinction, there are others which it is difficult to distribute to either.

There is no disease the onset of which is more unexpected or more violent. Rarely indeed are there any premonitory loss of appetite, languor, or headache. Even when the known presence of the disease in a family leads to anxious watchfulness, no deviation from the usual habits marks the individual subject of the next attack. The invasion is generally in the night. A child spends the day in the most perfect enjoyment of health, runs abroad freely, eats heartily, retires to bed as usual, sleeps soundly during the earlier hours of the night, awakes with sick stomach, vomits freely, throwing off the food taken perhaps at the mid-day meal, becomes restless and fretful, has great thirst and heated skin, and when returning daylight affords opportunity of investigation, is found thickly covered upon the face, neck, and chest with a vivid scarlet rash, consisting of minute points interspersed upon a uniform efflorescence, which disappears under the pressure of the finger, but is instantly renewed on its removal. The physician is sent for and finds the pulse beating with a rapidity almost pathognomonic of the disease, so that if precluded from any other mode of investigation, he might, with but little danger of error, predicate scarlet fever from its great frequency alone. The tongue is red and slightly coated with a white fur, through which frequent villi project, reminding him of the strawberry, by contrast; the surface being white and the protruding points of a vivid scarlet color. He looks further, and sees the whole mucous membrane of the mouth and fauces partaking of the same intense redness, with stigmata thickly sown upon it. The child is restless and distressed. Such would be the symptoms of the invasion of a case of simple Scarlet Fever.

Ushered in thus suddenly, the disease pursues a rapid course. Scarcely is the existence of the rash recognized before it is extended to the whole surface of the body; and finally to the lower extremities, which it reaches by the third day, at which period it begins to fade from the parts on

which it first presented itself; the whole duration of the disease not often exceeding five days. There is not in this, as in the pustular and vesicular exanthems, a diminution of the febrile symptoms with the appearance of the eruption. The rapidity of the pulse which is rarely less than 120 per minute, and the heat of the skin, remain unabated. There is no disease in which the heat of the surface is greater. Not only does it communicate a peculiar pungent sensation to the finger, but by actual measured observation it sometimes rises to 105°, 108°, or 110° of Fahrenheit. There is no elevation of the rash *essential* to this eruption, which is often attended by an itching almost as intense as that of urticaria; but in some cases there are small papular elevations on the arms and legs, and it is not at all uncommon to find innumerable clear vesicles of very minute size scattered over the thorax and abdomen, which are very perceptibly elevated both to the sight and touch. The serum they at first contain is rapidly absorbed, leaving the cuticle to form minute glistening scales, separating much sooner than the general desquamation, which takes place at the close of the disease. The intensity of the eruption does not mark the degree of violence; some very mild cases having a vivid universal rash, while in others equally benign it is partial in extent and less bright in its hue. In these cases of simple scarlet fever the condition of the digestive organs varies much. While in some there is an entire loss of appetite, in others there is as constant a desire for food as in health. The bowels are unaffected in the simple form, and indeed in the primary stage of all the varieties of the disease. The kidneys too, maintain their healthy functions during the first four days, but toward the close of many cases the urine becomes scanty in quantity and high colored, but destitute of any deposit.

The functions of the skin are impaired in proportion to the intensity of the eruption. In some mild cases I have known it to continue moist and even perspirable during the whole progress of the disease.

Peculiar as was the appearance of the tongue in the beginning, it becomes still more marked as the case advances. The fur which in the variety now under consideration is never dense, is thrown off suddenly on the second or third day, beginning generally to clear off at the tip and sides, and the surface is

left more entirely denuded than in health, of a color varying in intensity in proportion to the violence of the case. Sometimes but slightly reddened, at others it assumes a hue not much differing from that of raw beef, while the papillæ, elongated or swollen, rest upon a surface often smooth and glazed. This condition of tongue is doubtless owing to the same process taking place in the mucous membrane as that which is known as desquamation of the cuticle, and continues about the same length of time. The symptoms are sometimes so mild, and the nervous system is so little involved in the disease, that the patient may pass through all the stages without requiring any attention. You will find, however, when we come to treat of the sequela that such cases are by no means devoid of interest nor free from danger. Sometimes the character of an entire epidemic is thus mild, and this must undoubtedly have been the case in that recorded by Sydenham, who does not notice the anginose symptoms, though he describes with his usual perspicuity the symptoms as we have just given them to you.

It must not, however, be supposed that all cases of simple scarlet fever are thus mild in their character. In some instances from the intensity of the cause, and in others from the peculiarity of the individual attacked, the nervous system feels more decidedly the impression; and we then have the case complicated with symptoms of a more formidable character. The vomiting or nausea, by which, as I before remarked, the disease is almost invariably ushered in, may be accompanied or followed by violent convulsions; which are often of a peculiar, tetanic character. When the impression is less severe there will be constant contractions of the muscles of the forearm, with startings of the tendons, and twitchings of the fingers; and occasionally we have coma, or even the wildest delirium, manifested by screaming and frequent starting from slumber. On the third or fourth day it is no uncommon event to have the patient complain of pain in the ear, or seized with drowsiness, either of which, after continuing twenty-four hours, will in all probability be followed by the discharge of a thin serum from the external meatus auditorius, which excoriates the neighboring skin, and gives rise to a vesicular eruption in the adjacent parts.

As the rash fades it leaves the surface covered with a dry cuticle,

which separates in very thin scales successively from the face, neck, chest, arms, and legs. The density of these scales depends upon the part of the body and the violence of the eruption. They are very delicate on the face, neck, and arms, while from the hands and feet, where the cuticle is thickened by pressure, it comes off in large patches, and may even, in some instances, be brought away entire.

In the *Anginose* variety, we have the same series of events as those just described, and generally in an aggravated degree. The rash may appear even more vivid, or it may be present only in patches about the folds of the body and on the back and abdomen, or about the flexures of the larger joints, or sometimes only on the hands and feet. The nervous symptoms are more often manifested, and more violent when present. There is often very great tremor of the muscles and disposition to sleep, and when aroused the child is fretful. On looking into the throat there will be found not only the redness which has been described as marking even the cases which have no *anginose* character, but also a swollen condition of the tonsils and soft palate. They are sometimes *œdematous* from the very commencement; and corresponding with the internal disease, we find a tumor under one or both angles of the jaw, which is circumscribed and limited in size, and entirely different both in character and appearance from the diffused swelling which will be noticed hereafter. This tumor is not peculiar to scarlet fever, but is similar to that which occurs in every case of inflammation of the tonsils. The difficulty of deglutition is considerable from the very beginning, and there is very often stiffness of the muscles of the neck. The pulse has even greater frequency than was noticed before, but generally less force, yielding more before the pressure of the finger; corresponding in this respect with the general want of tone of the whole system, the frequency evidently depending not on inflammatory stimulation, but on nervous excitement. From the very commencement of the *anginose* affection there is an abundant secretion of viscid mucus which adheres to the surface of the tonsils and palate, and occasions much annoyance, disturbing the sleep and causing the patient often to start as though strangling; and when this condition extends to the mucous membrane lining the nostrils, and they become obstructed also, the interruption to the

free access of air not only adds to the suffering, but materially increases the danger by preventing the proper oxygenation of the blood already vitiated by the influence of the morbid poison. On examining the condition of the fauces there will often be seen deposits of lymph upon the surface of the tonsils, sometimes white, at others ash-colored and even darker, the color depending upon the presence of effused blood. These exudations have been mistaken for ulcers. In general they may be easily removed either by gargle or other mechanical agency, leaving the surface of the mucous membrane beneath them like the adjacent structure. In other cases they do cover ulcerated spots. This is, however, more frequent in that aggravated form which will claim our attention hereafter. They are generally confined to the surface of the tonsils, but occasionally extend to the fauces and even to the larynx; giving rise to one of the most formidable complications that can occur. The inflammation often extends from the fauces through the eustachian tube to the membrane lining the inner ear; giving rise to intense otitis. Still more frequently the lining of the external meatus takes on ulcerative action, as mentioned when describing the simple form. In either case the pain is severe, and the ulceration destroys the soft tissues, and even invades the bony structure of the ear; causing the loss of the ossicula and leaving the patient subject to prolonged offensive discharge and permanent loss of the sense of hearing. As in the case of the simple disease the tongue generally casts off its coat about the third day, assuming a still more angry appearance than that formerly described. Not unfrequently its edge as well as the mucous membrane lining the posterior nares and fauces take on ulcerative action, and then the lymphatic glands of the neck become much enlarged and exceedingly painful and tender to the touch. I have repeatedly seen both sides swollen, with effusion into the cellular tissue to such a degree as materially to impede the respiration of the child and totally to forbid deglutition. No more pitiable object can be presented than one of these cases. The commissures of the lips so sore that they bleed at every movement of the mouth; the tongue red and polished; the mucous membrane of the fauces turgid and ulcerated; the lymphatics of the neck swollen; and the cellular tissue of the

neck infiltrated with serum, till the hollow between the jaw and clavicles is entirely filled, and the skin is stretched and looks as though it were polished vellum; the head thrown back to remove the pressure from the swollen throat and to facilitate the access of air to the larynx; the nostrils distilling an acrid sanies which is puffed out with a sputtering noise at every expiration, and excoriates the lip and cheeks as it flows over them, and even abrades the cuticle from the back of the hands, instinctively applied to remove it from the nostrils, and thus afford more freedom of respiration; the corners of the eyes ulcerated also,—the wretched child lies unable to swallow; (even the smallest portion of liquid taken into the mouth being ejected through the nose,) and suffering all the pains of hanging; till the most earnest prayer of the fondest parent is for its death. Yet even from such condition we may hope for recovery.

In the anginose form the stages of the disease are as regular as in the simple variety. They are not, however, so perceptible. This is caused by the accession of these secondary sources of irritation which give rise to a fever even more intense than that which has been already described, which naturally terminates on the fifth day. In the most favorable cases the subsidence of the primary symptoms is followed by the decline of the ulceration and consequent glandular disease, and convalescence is established, until the occurrence of some of the sequelæ, which will be noticed hereafter. In other instances these secondary results do not develop themselves until after the crisis of the primary disease has been safely passed.

There is a complication which occasionally modifies this form of scarlet fever, and has given rise to some difficulty of diagnosis which it may not be improper here to refer to. Instead of the extreme symptoms just mentioned, there is only a slight ulceration of the mucous membrane of the nares, which gives rise to symptoms resembling coryza, and the whole case may be considered a cold with rash, and its true nature not being suspected in the primary stages, is first proven by the development of more formidable symptoms in the second stage; or, if the rash be better developed, there is sometimes difficulty in distinguishing the case from one of measles, as I have known highly intelligent and experienced physicians at a loss. This is more especially

liable to occur in those instances where an impeded respiration gives a darker hue than natural to the eruption.

But if in thus describing the horrors of the anginose scarlet fever, the mind turns with a shudder from the delineations of memory, what shall we say of the *Malignant form*? The mere presentation of the subject to you is "*infandum renovare dolorem*," and you may well desire to know it only by report. Under this term it is my intention to include only those cases which have by some been regarded as a violent form of the anginose scarlet fever, leaving for the class of *irregular* cases those varieties which, though of the most grave character, have no affection of the throat.

In *Malignant* Scarlet Fever there are violent pains of the legs and arms, and the rash may make its appearance on the back of the hands and the feet before it is seen on any other part of the body. The temperature of the body varies. In those cases in which the prostration is extreme, it is cold; and the rash, if it appear at all, has a livid hue, and may assume the appearance of purpura, and even be mingled with petechiæ and vibices. In some cases the rash comes out imperfectly for a time, and then disappears, re-appearing again so late even as the seventh day. Instead of the general flush like the efflorescence of the simple scarlet fever, there are only points about the flexures of the limbs, or those parts of the body which are kept the warmest. Often it does not appear at all, the whole body being rather of a *waxy paleness*; at other times there is an intense lurid erysipelatous flush which is even occasionally of a livid hue.

The condition of the throat and brain vary also; I have seen the brain intensely excited from the very onset of the disease, though in general there is coma more or less profound. The throat is swollen so as almost to render deglutition impossible. The tonsils, uvula, and soft palate lie flaccid, looking more like portions of purple velvet than living tissue; coated with black lymph in large portions; which, slightly loosened at the edges, betray an ulcer beneath; a horrible ichor discharges from the nostrils, and the room is filled with the most offensive fœtor. In many instances the powers of life are totally prostrated from the very beginning. A child will be running about in apparently perfect health one hour

"feeling its life in every limb," and manifesting its power in untiring gambols, and the next may be found with a glassy and sunken or upturned eye, feeble and frequent pulse, cold surface, great jactitation, and will sink steadily to death in despite of every effort; the sedative influence of the miasm being so intense that no reaction takes place. The disease is not in fact fully developed, and its character might be doubted were it not that the subsequent discovery of an imperfectly formed eruption about the neck, or the occurrence of other cases in the same family or neighbourhood, afford sufficient evidence of its true nature. But the chaste and accurate description of an epidemic form of the disease given by the distinguished Fothergill, nearly a century ago, can scarcely be improved upon. He says, "it comes on generally with such a giddiness of the head as commonly precedes fainting, and a chilliness or shivering like that of an ague fit; this is soon followed by great heat; and these interchangeably succeed each other during some hours, till at length the heat becomes constant and intense. The patient then complains of an acute pain in the head, of heat and soreness rather than pain in the throat, stiffness of the neck, commonly of great sickness, with vomiting or purging, or both. The face soon after looks red and swelled, the eyes inflamed and watery as in measles, with restlessness, anxiety, and faintness. The disease frequently seizes the patients in the fore part of the day. As night approaches the heat and restlessness increase, and continue till towards morning, when after a short and disturbed slumber (the only repose they often have during several nights,) a sweat breaks out, which mitigates the heat and restlessness, and gives the disease sometimes the appearance of an intermittent." (This fluctuation, even in diseases where the lesions are fixed and unchangeable, is one of the most mysterious circumstances which passes under our observation. The cause is as yet wholly unknown.) "If the mouth and throat be examined soon after the first attack, the *uvula* and *tonsils* appear swollen; and these parts, together with the *velum pendulum palati*, the cheeks on either side near the fauces, and as much of them and of the pharynx behind as can be seen, appear of a florid red color." (This color varies in different cases.) "The color is commonly most observable on the posterior edge of the palate in the angle above the tonsils and on the tonsils

themselves. Instead of this redness, a broad spot or patch of an irregular figure and of a pale white color, is sometimes to be seen surrounded with a florid red, which whiteness commonly appears like that of the gums immediately after being pressed with the finger, or as if matter ready to be discharged was contained underneath."

"Generally, on the second day of the disease, the face, neck, breast, and hands to the fingers ends, are become of a deep erysipelatous color, with a sensible tumefaction; the fingers are frequently tinged in so remarkable a manner that from seeing them only it has not been difficult to guess at the disease. A great number of small pimples, of a color distinguishably more intense than that which surrounds them, appear on the arms and other parts. They are larger and more prominent in those parts of the same subject, where the redness is least intense; which is generally on the arms the breast and lower extremities." (In a later edition of his works, 1754, Dr. Fothergill adds a note which is perfectly characteristic of the disease.) He says, "The *redness* and *eruption* have not accompanied this disease so regularly, during the latter part of this winter, as they did in the preceding seasons; in some cases they did not appear at all; in others not till the third or fourth day; and, as I have heard, in some not till the fifth, and even later." I have already drawn your attention to this want of eruption in many cases.

"As the skin acquires this color the sickness commonly goes off, the vomiting and purging cease of themselves, and rarely continue after the first day. The appearance of the fauces continues to be the same, except that the white places become more ash-colored, and it is now discoverable, that what at first might have been taken for the superficial covering of a suppurated tumor, is really a slough, concealing an ulcer of the same dimensions. All the parts of the fauces above mentioned are liable to these ulcerations, but they generally are first discoverable in the angles above the tonsils or on the tonsils themselves; though they are of ten to be seen in the arch formed by the uvula and one of the tonsils, and also on the pharynx behind, on the inside of the cheeks, and the base of the tongue, which they cover in the manner of a thick fur. Instead of these sloughs where the disorder is mild, a superficial ulcer, of an irregular figure, appears in one or more of these parts, scarce to be dis-

tinguished from the sound, but by the inequality of surface it occasions."

"The parotid glands on each side commonly swell, grow hard, and are painful to the touch;* if the disease is violent, the neck and throat are surrounded with a large oedematous tumor, sometimes extending itself to the breast, which, by straightening the fauces, increases the danger. Towards night, the heat and restlessness increase, and a delirium frequently comes on. This symptom, which appears in some even on the first night, seems to differ considerably from the like affection in other diseases. The sick commonly answer the questions put to them properly, but with an unusual quickness; they talk to themselves incoherently when left alone, and frequently betray the first tendency to this disorder by affecting too great composure." (In this circumstance it is only coincident with other malignant diseases, as yellow fever, cholera, &c.) "This, for the most part, happens to those who sleep but little, for some are comatose and stupid, and take little notice of anything that passes. In this manner they continue during two, three, or more days; they commonly grow hot and restless toward evening, which symptoms, and the delirium, increase as night comes on; a sweat more or less profuse breaks out toward morning, and from this time they are easier during some hours; a faintness only continuing, of which they frequently complain more than of the rest of their sufferings. The disease seems to have no stated period which can properly be called its *'Ακμή* or height. Some grow easier from the first day of the attack, but in general the symptoms of recovery appear on the third, fourth, or fifth day, and proceed in the following manner. The redness of the skin disappears, the heat grows less, the pulse which was hitherto very quick becomes slower, the external swellings of the neck subside, (sometimes they continue to increase and suppurate,) the sloughs on the fauces are cast off, the ulcerations fill up, the patient sleeps without confusion, is composed when awake, and his appetite begins to return.

The *pulse* during the whole progress of this disease is generally very quick, frequently 120 or more in a minute; in some hard and small, in others soft and full, but without that strength and

* This is an error. The swelling is not of the Parotid, but of the Lymphatic glands under the angle of the jaw.

firmness which usually accompany equal quickness and heat in genuine inflammatory disorders."

"If a vein be opened soon after the distemper is come on, the blood generally appears of a fresh florid red; the crassamentum is rather of a lax gelatinous texture than dense or compact; the serum yellow and in large proportion.

"The *urine* is at first crude, and of a pale whey color. As the disease advances it turns yellower, as if the bile was detected in it, and soon after the patient shows any marks of recovery, it grows turbid and deposits a farinaceous sediment."

LECTURE II.

The malignant being by far the most serious form of the disease, not only from the severity of the features and gravity of the results in individual cases, but from the fact that its epidemic visitations are more wide-spread and frequent than those of the milder forms, you will, I trust, pardon me, if I dwell somewhat at length upon the description of it. To the account of the disease as it appeared in London in 1747-8, just quoted from the accurate and conscientious Fothergill, allow me to add that of our own first medical writer of distinction, Dr. Benjamin Rush, who in his *Medical Observations and Enquiries*, thus describes the occurrence of this form of the disease in the year 1783, and 1784, in this city. "In most of the patients who were affected by it, it came on with a chilliness and a sickness of the stomach, or a vomiting, which last was so invariably present that it was with me a pathognomonic sign of the disease. The swelling of the throat was in some instances so great, as to produce a difficulty of speaking, swallowing and breathing. In a few instances, the speech was accompanied by a squeaking voice, resembling that which attends the cynanche trachealis. The ulcers on the tonsils were deep, and covered with *white*, and in some instances, with *black* sloughs. In several cases there was a discharge of a thick mucus from the nose, from the beginning; but it oftener occurred on the decline of the disease, which not unfrequently

happened on the fifth day. Sometimes the subsiding of the swelling of the throat was followed by a swelling behind the ears."

"An eruption on the skin generally attended the symptoms, which have been described. But this symptom appeared with considerable variety. In some people it preceded, and in others it followed the ulcers and swelling of the throat; in some it appeared only on the outside of the throat, and on the breast; in others it appeared chiefly on the limbs; in a few it disappeared on the second or third day of the disease, and never returned afterwards. I saw two cases of eruption without a single symptom of sore throat."

"The fever which accompanied the disease, was generally the typhus mitior of Dr. Cullen. In a few cases it assumed symptoms of great malignancy. The disease frequently went off with a swelling of the hands and feet. I saw one instance in which the swelling was absent, but the patient complained of very acute pains in the limbs, resembling those of rheumatism."

"In two cases which terminated fatally there were large abscesses; the one on the outside, the other on the inside of the throat. The first of these cases was accompanied by troublesome sores on the ends of the fingers. One of these patients lived twenty-eight, and the other above thirty days, and both appeared to die from the discharge which followed the opening of the abscesses."

"Between the degrees of the disease which I have described, there were many intermediate degrees of indisposition which belonged to this disease."

"I saw in several cases a discharge from behind the ears and from the nose, with a slight eruption, and no sore throat; all three patients were able to sit up, and walk about. I saw one instance of a discharge from the inside of one of the ears in a child, who had ulcers in the throat, and the squeaking of voice. In some, a pain in the jaw, with swellings behind the ears, and a slight fever, constituted the whole disease. In one case the disease came on with a coma, and in several patients it went off with this symptom. A few instances occurred of adults

who walked about, and even transacted business until a few hours before they died."

"The intermitting fever, which made its appearance in August, was not lost during the month of September, (the time at which the scarlet fever became prevalent.) It continued to prevail, but with several peculiar symptoms. In many persons it was accompanied by an eruption on the skin and a swelling of the hands and feet. In some it was attended by a sore throat and pains behind the ears. Indeed, such was the predominance of the scarlatina anginosa, that many hundred people complained of sore throat without any other symptom of indisposition. The slightest occasional or exciting cause, particularly cold, seldom failed of producing the disease."

"The epidemic prevailed in Philadelphia, from September throughout the winter. In the Spring it disappeared, but spread afterwards through the neighboring States of New Jersey, Delaware and Maryland."

You will here observe, that while the prevailing type of the epidemic thus described, is of that severe character which brings it under the form of the disease which now claims our notice, the occurrence simultaneously of cases of a milder degree, prove their dependence on the same cause. Were it proper to burden your memory or exhaust your attention by swelling these quotations, I might add to them similar descriptions of the disease given by distinguished writers upon medicine in each succeeding generation. But as you are, I trust, prepared to recognize it, should you ever be called upon to combat its malign influence, we will pass on to the consideration of the last of the four classes or groups of cases, into which I have proposed to distribute the disease.

While the *anginose* and *malignant* are the predominating types during every severe epidemic prevalence of the disease, and the *simple* form that which is generally found in sporadic cases, those which I am now to describe are found associated with the two former classes; occurring at the same time, and either in the same households, or in such circumstances as to prove their dependence on the same cause. The very term *Irregular*, by which I have designated this divi-

sion, will at once convey to your minds, the suggestion that it must be impossible to give any general description which would embrace all the varieties included under that term. I shall therefore be compelled to enter into the detail of individual cases. By far the largest number owe their peculiar features to that condition of the nervous system which gives rise, in other febrile diseases also, to that collection of symptoms which marks what are erroneously called *congestive* cases. The vital forces are overwhelmed by the intensity of the morbid impression, and the patient dies without time being afforded for the disease to develop its essential features; or, if the duration of the case be more prolonged, so extreme is the force of the cause of disease, or so inadequate the power of resistance, that the development is only partially accomplished. The suddenness of the invasion has been noticed already as one of the peculiarities of scarlet fever. These cases are marked especially by this sign. I have known an infant, which had left home, apparently in perfect health, for its usual morning airing, brought back within an hour, with stupor and general muscular relaxation, cold surface, feeble pulse and total insensibility; no remedies that could be applied, produced any reaction, and it died within twelve hours. Two other children in the same family were seized within a few days, by scarlet fever, which manifested the usual signs, and ran a regular course, and thus placed beyond cavil the true nature of the case which preceded them. In another instance, while visiting a lady laboring under a chronic malady, my attention was drawn by the mother to the unusually healthful condition of an only child of two years old, gamboling on the floor. Within twelve hours, I was called to see it lying comatose and convulsed and within twelve hours more it was dead. A maculated appearance of the skin, and the known prevalence of scarlet fever in the vicinity, were here the only grounds for assuming this to be the nature of the disease, as there were no other children in the house, to be subjected to the poison. Dr. Rush, you will remember, reports "a few instances of adults, who walked about, and even transacted business, until a few hours before they died."

It is not many years since a Judge in one of our Courts was seized with nausea while on the bench, and retired to his home,

where for two days he remained, scarcely willing to admit himself to be sick, and reluctant to confine himself to his chamber, though the rapid, feeble pulse, and an imperfect eruption, too plainly indicated the nature of the affection; and on the third day he died, while in the act of shaving himself.

Dr. George Gregory, in his lectures on Eruptive Fevers, delivered at St. Thomas' Hospital, London, reports the observation of cases of a somewhat similar kind. He says, "In some extreme cases, the nervous system shall be so completely depressed and subdued by the virulence of the miasm, and the mass of the blood so thoroughly poisoned and disorganized by it, that all the ordinary appearances of scarlet fever are masked; petechiæ, coma and a sloughy state of the throat alone appear. Life rapidly yields under such an attack." In confirmation of this assertion, he reports as having passed under his own notice, the case of a family, in which "a mother and two grown up daughters died. In each of the three cases the nervous system was utterly prostrated, and in a state of collapse. There was no violence, no delirium, no struggling for breath, but the pulse was small, the skin cold, and the whole system depressed by the intensity of the poison. Neither wine, brandy, nor capsicum could put any life into them. They sunk, one after another, without any attempt to rally. It was difficult to believe the disease *Scarlatina*, but the eldest son took it in the usual form, and put the matter beyond doubt."

A lady, near the close of gestation, had the usual symptoms, which resulted from "taking cold" after fatigue and exposure, by which she was confined to the bed during two days, and from which she apparently quite recovered. After an interval of twenty-four hours, she was seized with a chill, followed by fever, with exceedingly rapid pulse and slight swelling and redness of the soft palate and uvula. I shall not detain you by the description of the treatment, which is irrelevant to the point now under observation, further than to remark that it was promptly administered and decidedly and actively antiphlogistic. There was never in the progress of the case, any great degree of internal swelling of the throat, and not the least about the neck externally; cough and dysphagia, with an entire inability to lie down, from the danger

of suffocation, were the urgent symptoms. The heat of the skin was very great, but without any redness of the surface; the circulation continued exceedingly rapid throughout, and the countenance expressive of the greatest distress. The power of uttering sounds was lost, and there were some slight deposits of lymph on the uvula. This difficulty of swallowing, loss of voice, *rapid pulse* and great heat of skin, were the prominent symptoms, which continually increased in spite of the most energetic treatment, until she died on the fifth day of the disease, about twelve hours after having given birth to a living child. I was assisted in the treatment by three of the most eminent physicians of the city, none of whom suggested scarlet fever as the nature of the case. Examination of the body after death, exhibited, with sufficient clearness, the cause of these symptoms. A small abscess between the posterior walls of the pharynx and the vertebræ had caused the difficulty of swallowing, while minute deposits of pus beneath the mucous membrane on the arytenoid and cricoid cartilages, destroyed the voice. These lesions could not, however, have caused death so promptly, nor would they have given rise to the excessive rapidity of pulse, and heat of skin. Within a week after her death, two well marked and violent cases of scarlet fever, with severe anginose symptoms, occurred in the same house. One in the person of the nurse, who had waited upon the case I have thus described, and the other in that of a child.

In another instance, an infant, endowed with great vigor of constitution, was taken ill with febrile symptoms accompanied by slight difficulty of deglutition. No appearance of disease of the fauces was manifest to the most careful examination, beyond a very slight redness of the edge of the half-arches. Soon the voice became enfeebled, and the respiration impeded, but without cough. The pulse was very rapid, the skin hot and dry, but bloodless, presenting a waxlike paleness. The glands about the base of the jaw became swollen, the cellular tissues of the neck infiltrated with serum: the difficulty of swallowing increased, the voice became stridulous. These symptoms grew progressively worse till the child died, exhausted by the violence of the febrile reaction. Inspection of the body after death exhibited a super-

ficial ulceration of the mucous membrane lining the larynx and upper part of the trachea, which had given rise to the glandular swelling and œdema. The rapidity of the pulse, heat of skin and peculiar condition of the neck, all combine to induce me to class this case with scarlet fever without hesitation. I have no doubt that other cases, well developed, would have followed, had there been children in the family. Many other similar cases have fallen under my notice, which have been so very evidently connected with this disease, as to forbid a doubt on the subject.

The course of the disease in the *Malignant* and *Irregular* forms, cannot be reduced to the regularity which marks the *Simple* and *Anginose*. In the simple uncomplicated form, the fever subsides from the 5th to the 7th day; and in favorable cases of the anginose variety, the primary lesions disappear with it, and convalescence is fairly established. When the ulceration of the throat and posterior nares is more severe, the primary fever is, on the contrary, merged insensibly into the fever of irritation produced by these lesions, and the case may run an uninterrupted course of many weeks; while in the malignant form, the patient may either sink into a comatose condition and die from the first force of the disease between the 3d and 9th day, or, if there be reactive force sufficient to carry the case over these periods, there still remains the irritation resulting from sloughing ulcers of the throat, abscesses beneath the jaws, and ulceration of the nares and ears, to be added to the depressing influence of the primary disease; and not unfrequently acute meningitis supervenes, and causes death with the usual symptoms of that disease superadded to those already described. Croup is also an occasional complication, either caused by the extension of the deposits already described as frequently occurring on the tonsils, or by the active inflammation of the larynx without any exudation. I have seen it in one instance prove fatal when the anginose symptoms had been very slight indeed, and where the most careful investigation could not detect the smallest exudation in the fauces. In the anginose malignant forms, the extension of the disease to the larynx and trachea is by no means uncommon, and I believe more careful observation will confirm the suspicion I

entertain, that the disease known as Croup, which begins with inflammation of the tonsils and exudation of lymph—gradually extending to the larynx—is one of the forms of the disease now under consideration. To this conclusion I am led by having observed that such cases are particularly prevalent at the times when we know the scarlet fever influence to be most active, and from their evident dependence on some other cause than the mere vicissitudes of temperature which give rise to the inflammatory croup. The rapidity of the circulation, the tendency to gangrene of the throat, the general similarity of all the symptoms to those cases of undoubted scarlet fever in which the disease extends to the larynx, and the frequent occurrence of several cases in immediate succession in a family, all tend to the confirmation of this impression.

There has been some diversity of opinion as to the *cause* of scarlet fever. That it depends on some unknown agency, producing what is known as epidemic influence, no one denies. In what this influence consists it is impossible to determine, with our present limited knowledge and means of observation. Telluric emanations, sidereal influences, animalculæ and fungi, have all been invoked in their turn. It were vain to attempt to decide between these rival claims; a more important question demands our attention, and should be carefully examined. Is it ever propagated by contagion? The evidence in the affirmative is so positive that I cannot admit a doubt; so many well marked cases have passed under my own notice, and so many more are reported on authority quite beyond question, that I see not how any one can hesitate. It is asserted by those who disbelieve the contagiousness of the disease, that the instances in which single cases occur in a large family or school, without extension to others, even where no precautionary measures are adopted, are sufficiently numerous to disprove the influence of contagion; which, if characteristic of the disease, must operate equally at all times where it meets with subjects not protected from its attacks; and they aver that its extension, when this does take place, may be ascribed with greater propriety to a general exposure to the epidemic influence, the operation of which is acknowledged by all, than to contagion. Those who thus reason,

however, overlook the fact, that even the diseases which all confess to be possessed of a power of propagating themselves are liable to the same uncertainty. I have, more than once known a single case of small pox to occur in a large family, without spreading, though no precautionary measures were employed ; and what physician is there who has not been annoyed by the necessity for repeated insertions of vaccine virus, the susceptibility to the impression either wholly absent, or too feeble to be kindled into activity. The question of contagion is not one of merely speculative interest. Its practical bearings are highly important. Allow me, therefore, to mention some of the facts which prove it. I had a child under my care with scarlet fever of a very severe grade. The aunt came to the city from a section of country in which there was no disease prevalent, and took the complaint. A gentleman died of scarlet fever ; a relative who had been alienated from him for many years visited the body, and died within a fortnight of the same disease. Those engaged in nursing cases of scarlet fever, and often all the adult members of a family in which it is present, are liable to sore throat and fever, without any eruption. The wife of a medical friend of mine, who was aiding in the care of the children of a relative, was seized with this modified affection, and communicated scarlet fever in all its integrity to her own children. It frequently happens that children who have had the disease absent from home, communicate it to others on their return during convalescence. This brings naturally to our notice another question. Can the principle of contagion attach itself to the clothing or persons of those who are not themselves affected by it, or the disease be conveyed or communicated by them? My own observation leads me to deny the possibility of the communication by mere transient intercourse. I have never, in long continued and extended practice, known the disease to occur in a family which I was visiting for other complaints, during my attendance, nor have I ever heard of an authenticated instance in which this has occurred. I have, however, known an instance in which a family had abandoned their dwelling immediately after the occurrence of two fatal cases. The house was left uninhabited during several months ; when a family, from a distant city, in which the disease was not prevail-

ing, took possession of it, and the furniture which had been allowed to remain. Within two weeks the disease made its appearance in the family, and proved fatal to several children. Dr. Percival, of Dublin, than whom we can have no higher authority, in writing to Dr. J. Mason Good, says, "*Cynanche Tonsillaris* and *Maligna*, I consider with you a species of *Roseola*. (This is the term applied to scarlet fever by Dr. Good.) All have been produced by the same specific contagion, which in one instance was imported here from England in a Pandora's box, containing plumed soldiers, which had served to beguile the convalescent hours of a young family, and were sent by them as a present to their quondam playmates in this capital."

The late professor Hosack of New York, in supporting the doctrine of its contagious character, mentions the instance of a family who deserted their house after a fatal attack of scarlet fever. It was thoroughly cleansed and whitewashed, and the family remained absent six weeks. Immediately on their return, the disease reappeared. There is one source of fallacy in this case. The period of *incubation*, as it is termed, the time which elapses between the exposure to the sources of the disease and its development, during which the cause is supposed to lie latent in the system, but preparing to exhibit its characteristic features, is more uncertain in this, than any other disease of the same class. It is therefore not impossible that the germs of the disease may have been imbibed before leaving the house, either directly from the same source as the first case, or mediately through it. No such suspicion throws a shade on the instance I have mentioned before. The following cases will prove as well the contagious character of scarlet fever, as the uncertain duration of this latent period. A lady came from a section of country wholly exempt from this disease, to assist in nursing the child of a brother. Within forty-eight hours after her arrival, she was herself seized with a well marked attack. This is the shortest interval between exposure and sickening I have seen or read of. The longest I have known, was twenty-eight days. This case was equally well marked. A gentlemen designing to spend the summer in Europe, had engaged passage for himself and family to sail on the 1st May. One of his three

children was seized with scarlet fever on the 1st day of March. Desiring that all should have the disease, and be quite recovered before leaving, no interruption of intercourse with the other children was attempted; the two children who were well were allowed free access to the room in which the sick one lay. The second seizure occurred on the 16th of March, and the third not until the 28th. Dr. Maton reports a case in which twenty-six days intervened. From eight to fourteen days is however the usual interval; and though occasionally several cases may occur simultaneously in a large family or school, it is much more common that one should be first taken sick, and another after an interval of greater or less duration, rarely beyond ten days; and then the other members of the family or household, who have not previously had the disease, are taken sick at about the same time, or in more rapid succession; while the adults are all more or less brought under the influence of the disease, with sore throat and fever. This mode of invasion by successive cases is almost uniform, and is certainly more easily accounted for, on the presumption of contagion, than in any other manner.

The attempt has been made to impart the disease by inoculation, but without success. This was to have been anticipated, as there is no analogy between this disease and variola, which would lead to the presumption it could be thus communicated. Whether introduced by contagion, or originating in some unknown atmospheric changes, scarlet fever is very often *epidemic*. In this respect it manifests a peculiarity as decided, as in other points of character. It is often bounded by very narrow limits. Not only will one part of a large city be exempt while it prevails in another, but I have known it confined to a single block of houses, while all the neighboring squares were healthy. Sporadic cases are frequently occurring, but these are always mild, and generally of the simple form, or with slight anginose symptoms. It often prevails in this mild manner, or entirely disappears for several years, until its malignity is almost forgotten, or may be even doubted. This was decidedly the case in our city for many years before 1830. Dr. Emerson says: "It is a remarkable fact, that in the twenty-one years from 1807 to 1827, inclusive, the total mortality from scarlet fever was only

102 out of 53,000 deaths. Doubtless some cases were reported in the bills of mortality under the vague title of sore throat, of which the amount during the whole period referred to, was 355; but with such additions, the proportional mortality from scarlet fever, would be trifling compared with its ravages in more recent years. *Only one death was reported in 1827, not one in 1828.* In 1829 there were 9, in 1830, there were 40. Since the last named year, the mortality from this source has very much increased, as will be apparent from the number of deaths reported in the subsequent ten years, viz.

1821,	200.	1836,	240.
1822,	307.	1837,	205,
1833,	61.	1838,	134.
1834,	83.	1839,	225.
1835,	205.	1840,	244.

Making a total mortality from this cause in ten years, of no less than two thousand and four cases." Dr. Emerson's conjecture that some scarlet fever cases were included in the 355 deaths from sore throat, is undoubtedly correct, as I know there was an epidemic angina during the period embraced in those returns. It was in the year 1828, in which only one death from scarlet fever is reported, I received an appointment in the Dispensary; and the district allotted to my care was that in which the epidemic, which began in 1829, and increased so fearfully till the year 1832, first exhibited its ravages. The contrast afforded by the comparison of the three years, 1827, 28, 29, with the three which followed, exhibits the point I wish to illustrate. So remarkable is this feature of the destiny of scarlet fever, that repeatedly it has been described as though it were a new disease—a whole generation of medical practitioners passing without the appearance of an epidemic.

In the year 1831, a highly respectable physician, very extensively engaged in practice, told me he had never seen a fatal case of scarlet fever; his testimony thus corresponds with that of the bills of mortality for the period during which he had pursued his professional career. There is no fixed term of duration of these epidemic periods. In some instances a grand epidemic cycle appears, composed of series of minor epidemics. Thus, for instance, the table furnished by Dr. Emerson through

the entire ten years, may be considered one epidemic period, in contrast with the twenty which preceded, there are two marked interruptions to the otherwise regular average mortality. Though, as I have before remarked, the epidemic visitations of this disease, generally partake of the typhous or malignant character, it occasionally happens that one may assume the sthenic form, and be attended with active inflammatory complications. In this respect the history of the past is instructive, as we shall find when we come to consider the treatment appropriate to the disease. Neither season of year, nor temperature appear to exert any influence over it. By some writers the winter, and by others the summer, is assigned as the period especially favorable to its diffusion. The worst epidemics I have seen, have been in the changing weather of the spring and fall.

LECTURE III.

As yet every step taken in the process of investigation into the nature and habits of the cause of this disease, leads further from certainty as to its character and the laws by which it is governed. Though prevailing most frequently during the changeable weather either in the spring or autumn, and extending itself through the winter, in this respect manifesting its affinity to other febrile eruptive diseases with which it is sometimes associated, measles, erysipelas, and varicella, it is much more common to meet with isolated cases of it than of them which can not be traced to any infection, and which fail to propagate the disease in others who are brought most closely in connexion with it.

I have seen quite recently, during the intense heat of July, one well marked and fatal case, in a large family of children, without spreading to any other members, though no attempts at isolation were made. Similar cases are familiar to every physician. The access to the chamber was as free, and the visits of the other children were as frequent, as the warmest affection

could dictate. The subject was the youngest child, and an only daughter, and therefore the least exposed to external influences; it were vain to attempt any solution of the question from whence the miasm was derived which gave rise to this case. Such are of frequent occurrence, and if received without any investigation of the circumstances which modify them, and without any regard to others of an opposite tendency, would shake the faith of the most devoted believer in the contagious character of the disease. There is, however, some peculiar want of susceptibility to the impression of morbid poisons in this family, as they had escaped with equal impunity, a few months previously, when varioloid was brought into the house by a relative, taken into it, without the adoption of any precautionary measures, from a boarding house where he had sickened with that disease.

Some eminent teachers of medical science are disposed to solve the difficulty growing out of the frequent observation of such cases, in a very summary manner. Whilst they admit them to be characterized by all the symptoms of scarlet fever, so that we cannot in any way distinguish them from that disease, they think the mere absence of the power of propagation, and the inability to trace them to any connexion with a previous case or epidemic influence, sufficient reason to consider them an entirely distinct disease. Such is the opinion of Professor Mitchell, and such appears to be that of Dr. Chapman, who, in his lectures on exanthematous fevers, says, "Moreover I have repeatedly met with in the winter, and uniformly, I think, when snow is on the ground, an affection bearing a still closer resemblance to scarlatina. Children acquire it, mostly, or perhaps exclusively, by becoming heated from playing in the snow, and then suddenly chilled. The collapse is often very considerable, followed by febrile reaction, much cerebral disturbance, delirium, stupor, and sometimes convulsions, sore throat, nausea and vomitings, and by an eruption so scarlatinous in its aspect, that it may readily be mistaken for that disease. Nor is it scarcely less fatal. Death, I have known to take place from it in a few hours, from an inability to arouse the system out of its torpor, or by convulsions." You are well aware of the high estimate I place on the quickness of perception, clear judgment, and perfect accuracy of

of Professor Chapman, and long observation has given me entire confidence in the correctness of his diagnosis; yet even the weight of his authority cannot lead me to doubt the dependence of the cases he thus describes upon the miasm which produces scarlet fever. While we know, on the one hand, that the causes of other diseases may lie long dormant in the system, only waiting for exciting circumstances to develop their activity, and, on the other, that even the most contagious diseases occur occasionally as sporadic cases, it appears to be more in accordance with analogy to consider such cases as scarlet fever, failing to diffuse itself, from some unknown cause, than to erect a new form of disease distinguished from scarlet fever by no symptom, but this one negative characteristic.

In the month of December, 1832, the disease appeared among the inmates of the House of Refuge for juvenile offenders. It was prevailing in the city at that period, as will be proven by reference to the table furnished by Dr. Emerson which exhibits the mortality of that year as the highest in the ten years from 1830 to 1840. The discipline of this institution is such as secludes the children almost entirely from communication with persons beyond its walls. This might be supposed to afford an unusually valuable field for observation on its introduction and mode of diffusion. The difficulty we encounter, however, in determining the manner in which it was introduced into the institution, is one which exhibits the obscurity in which the question is enveloped. I was at the time the attending Physician, and made a daily record of every case of sickness requiring my care, in a book kept in the institution for that purpose. A few cases of sore throat had been noted; one of erysipelas, and several of varicella, all on the boys' side of the institution, within the fortnight which preceded the breaking out of scarlet fever.

The first well marked case, however, occurred in the person of a visitor to the family of the matron, thus throwing a strong shade of uncertainty on the question of origin. The second was that of a sister of the first; and the first cases among the permanent inmates occurred at the time of the convalescence of the first patients, in the matron's family. Had no cases of

sore throat among the children preceded the first well developed case, the presumption that the disease had been introduced by her from without, would have been strong, especially as the apartments occupied by the matron's family, were in that part of the premises appropriated to the females, and it was among the females the disease first diffused itself. The buildings are extensive, surround a very large enclosure, and are so arranged as to effect a separation of the sexes at *all times*. The disease spread rapidly among the girls, five cases occurring simultaneously on the 25th of December; and one boy on the 29th of the same month; two other boys were taken on the 11th of January 1833. On the 19th a case of varicella was presented among the boys, followed by several others within the following week. Scarlet fever and sore throat without eruption, continued to prevail among both boys and girls till the end of March, amounting in all to sixty cases, without one fatal termination. If no case of sore throat with fever among the children had preceded the sickness of the visitor, this history would have been very decidedly favorable to the idea of the dependence of the disease on contagion; and this would have been strengthened by the manner in which it spread to her immediate attendants, and the inmates of the apartment in direct communication with her sick room. The interval also between the first case and those which followed, was such as is most conformable to the idea of its contagious character; and this is confirmed by the number then seized simultaneously. But any positive decision as to the mode of introduction, is forbidden by the previous prevalence of sore throat, with fever, among the children. MM. Rilliet and Barthez, in recording their observation of the disease, in the wards of the Hospitals for sick children in Paris, appear, on the contrary, to be able to trace every period of its prevalence in that institution, that came under their notice, to the introduction of a patient suffering with it, from whom it spread to the children who had been brought in with other diseases.

Among the circumstances which favor the idea of some influence which is propagated in the person of the sick, and thus diffused from one individual to another, no slight degree of importance is due to the fact that it is said to be unknown in those distant colonies settled by Europeans, the voyage to which is so long

that the influence of the specific poison is exhausted before the arrival of the vessel in which it might be transported to their shores. Thus it is said to be unknown in the thickly peopled and civilized colonies of Australia and Van Dieman's Land; and Dr. Gregory asserts that there is no record of its prevalence in the Indian possessions of Great Britain. If direct contagion, or the transportation of some "*materies morbi*," eliminated in the progress of a case, be necessary to act as a ferment in diffusing the disease, and its epidemic prevalence has never an independent origin, places thus far removed from the old centres of civilization may forever remain exempt; unless we adopt the extreme view of Dr. Elliotson, as quoted by Dr. Chapman, who believes the infecting cause may be retained in the apartments where the disease has once existed, a much longer period than that occupied by these voyages. He asserts that "all the children admitted into a particular ward under his care, in one of the London Hospitals, were seized with scarlet fever for two years, in consequence of a patient with the disease having been in the ward at that remote period, and this, in despite of white-washings and other cleansings." The want of any regular medical reports from those countries, leaves a doubt as to the accuracy of the statement, that scarlet fever is unknown there. The point is one well worthy of investigation, and our own new settlements on the Pacific, will afford an excellent field for careful observation.

Reasoning upon the probabilities of the case, we should be disposed to the conclusion that it would be found to exist in all parts of the world. The constituents of the atmosphere, the physical arrangements of the material creation, the nature of man himself, his tendencies and susceptibilities, have ever been the same; it would be therefore but a natural presumption, that the diseases to which he is subject should undergo no greater modification than results from the varying habits which mark different stages of refinement or circumstances of wretchedness.

True it is, that diseases supposed to be new, have from time to time made their appearance, and diffused themselves in a manner as mysterious as scarlet fever. Black death, sweating sickness, cold plague, cholera, have each in successive ages, performed their ministry, by thinning out the teeming population of the

earth, and then disappeared from observation. But the imperfect records of these visitations, which have been transmitted to us leave room for the doubt whether they have not been mere modifications of the same disease, or the revival of plagues, the records of which have escaped from the grasp of history. The great diversity in character, presented by different epidemics of scarlet fever, when taken in connexion with the known dependence of these several forms of the disease on one common cause, appears to favor such an assumption. Were it not so entirely established by testimony beyond contradiction, who could believe that forms of disease so apparently dissimilar as those assumed by scarlet fever in its different epidemic visitations, depend on a common cause? So frequently does this disease disappear from observation in a given district, (and occasionally, as we have seen, even from large cities,) so varying are the phases in which it presents itself, and so uncertain are the traces of the mode by which it has been introduced, that until further light is thrown upon it, we must be content to believe that it does at times commence anew from the operation of unknown influences.

Far from us be the worse than pagan infidelity, which would overlook the interference of Divine Providence, in the ordering of times of sickness or of health. If heathen moralists and heathen poets could recognize the interposition of the Gods, or seek to appease the rage of an incensed Apollo, it were surely shame for those who live in the light of Revelation, to rest on second causes only. It is, however, a duty incumbent on us as members of that profession to which the community entrusts the interests of health and life, to investigate narrowly, all second causes and collateral circumstances, which may furnish occasion for the origin, or facilitate the diffusion of this, as of every other of the many diseases, which are employed as "scourges of humanity." False indeed, were that faith, alike unsound in its foundation and disastrous in its application to man's necessities, which would teach us to lay aside our reason and cease to exert our powers for self protection. If variola may not be exterminated, nor cholera driven from the pale of civilization, vaccination mitigates the horrors of the one, and cleanliness and free ventilation, abate the intensity of the other. So if scarlet fever depend for its diffusion upon direct contagion alone, we may curtail its extent by proper pre-

cautions, which are, however, onerous and inhuman, if it have no such power of propagation. I would therefore, urge upon you, to begin from the very commencement of your professional career, a series of careful records of every fact which can throw light upon this question, not only with reference to the disease now under consideration, but all others of a kindred character. It is as much the duty of the physician to foresee the coming evil, and recommend precautionary measures, as to cope with disease in its individual manifestations in the chamber of sickness. The remarks of Dr. Rush on this subject are scarcely too strong, when in speaking of yellow fever, he says, "to all natural evil, the Author of nature has kindly prepared an antidote. Pestilential fevers furnish no exception to this remark. The means of preventing them, are as much under the power of human reason and industry, as the means of preventing the evils of lightning and common fire."

To trace down from remote ages, the mere record of the early history of the disease would be an unprofitable consumption of our time, too limited already for the investigation of matters of greater importance to you. It is not uninteresting, however, to know that this same uncertainty, as to its origin and mode of extension, has marked its character in every age; and hence, before the free diffusion of knowledge, through the agency of the press, put the members of the profession in possession of more extended information as to what was passing, or had occurred beyond the sphere of their own observation, it was *frequently* reported as a *new disease*. The earliest trace of its existence which has fallen under my own notice, dates in the first century of the Christian era, and is found in one of the tragedies of Seneca, where a chorus describes the devastation of Thebes by the plague, with which that city was visited on account of the involuntary incest of Œdipus, in the following terms:—

O dira novi facies leti !
 Gravior leto ! Piger ignavos
 Alligat artus, languor, et ægro
 Rubor in vultu, maculæque caput
 Sparsere leves: tum vapor ipsam
 Corporis arcem flammeus urit
 Multoque genas sanguine tendit.

Oculique rigent, et sacer ignis
Pascitur artus. Resonant aures,
Stillatque niger naris aducæ
Cruor: et venas rumpit hiantes:

To those of you who have retained your familiarity with classic literature, it were an ungracious act to attempt to point out the admirable adaptation of this description, to the malignant form of the disease now under consideration. No poet or philosopher of the present day could furnish a more accurate delineation in the same number of words, unless himself familiarised with the disease by personal observation. Every lineament traced by the poet, is admirably correct. The adjunction of the *new* form of mortality more dreadful than death itself; commencing with languor of the limbs, while redness appears upon the face, and light spots are diffused over the head, from whence the influence extends to the trunk, while the parts about the jaws are distended with blood, and the eyes are distorted and a red flush is diffused over the limbs, the ears disturbed by ringing sounds, a black discharge flowing from the nostrils, and gaping ulcers are formed in the passages, all are highly characteristic. But that which Seneca then considered a new disease, has been called such many times in succeeding ages, disappearing for a period of longer or shorter duration, only to reappear in one of its several types. By the earlier medical authors, whose works have been handed down to us in imperfect fragments, all epidemic diseases were concluded under the general term of *Loimos* or *Pestilence*; the whole family of plagues was thus grouped together. Slowly, one after another was singled out for more accurate description, but it was not till the beginning of the 17th century, that scarlet fever was separately described, and then by the Spanish and Italian authors under the terms *Garotilla* and *morbis strangulatorius*, names in themselves sufficiently descriptive to designate the disease.

Even long since that period it was, by many, confounded with measles, to which fact we may ascribe the mortality of some nominal epidemics of that disease. The accounts given by these authors refer to epidemics which prevailed in the interval between 1610 and 1650, during which time it was marked by fearful mortality. How completely it had lost its formidable character

when Sydenham describes its appearance in London, in 1690 to 1695, may be inferred from his assurance that it is "a disease more in name than reality." Had Fothergill's reading been confined to Sydenham's account, he might well have regarded the epidemic, which came under his notice in the same metropolis in less than a century, as a new disease. Equally great have been the subsequent changes as recorded by the European writers, to whose works I must refer you for additional information on this point, and especially to the elaborate article by Dr. Tweedie in the *Cyclopaedia of Practical Medicine*.

The earliest record I have been able to trace of its existence on this continent, reaches back to the year 1734—5 at which time it was prevalent in America and Europe simultaneously; and so great was the mortality caused by it in Boston, that we find the number of deaths in those years raised from 458, the number of the year 1733, to 528 in '34, and 617 in '35. At the same period the interments in the burial grounds of Christ Church and St. Peters in Philadelphia, rose from 96 to 144, and a like increase occurred in the same places from a similar cause in 1742. When we recall to mind the difficulty of communication between the Colonies at that early period, and the consequent infrequency of intercourse, and reflect on the small probability that those who were sick or so recently convalescent, as to carry about them a contagious influence, could endure the fatigue and exposure necessarily incident to the only modes of conveyance then known, we shall be disposed to adopt the solution afforded by the prevalence of a wide spread epidemic influence, as the means of propagation.

There is an exceedingly interesting paper by Cadwallader Colden, Esq., of New York, published by Dr. Fothergill in the 1st volume of the "*Medical Observations and enquiries by a Society of Physicians in London*," dated Coldenham, in New York, October, 1753, which throws unexpected and important light on the history of the disease on this continent. The whole document is one of great merit, and deserves to be borne in mind as a favorable specimen of our earlier medical literature. Mr. Colden remarks, "I have seen it only in my own family, and in a few neighbors in the country, to whom I sometimes give advice when they cannot obtain assist-

ance otherwise, having laid aside the practice of physic, upwards of twenty years. What I chiefly learned was from the late Dr. Douglass* of Boston, a gentleman of great skill in medicine, and an accurate observer, having corresponded with him while this distemper was frequent in the part of the country where I live."

"The first appearance of the throat distemper was at Kingston, an inland town of New England, about the year 1735; and as this town has no foreign trade, it may be concluded that the disease was not imported. It spread from thence and moved gradually westward, so that it did not reach Hudson's river till two years afterward. It continued some time on the east side of Hudson's river before it passed to the west, and appeared first in those places to which the people of New England resorted for trade, and in the places, through which they travelled. It continued to move westerly till, I believe, it has at last spread over all the British colonies on the continent."

"Though what I have mentioned seems evidently to show that the disease was propagated by infection, yet it did not spread in the same manner contagious distempers usually do; for children and young people only were subject to it, with a few exceptions of some few above twenty or thirty, and a very few old people who died of it, neither did it spread equally in all places that were equally exposed to the infection. The poorer sort of people were more liable to have this disease than those who lived well with all the conveniences of life. It has been more fatal in the country than in the great towns. People of a scorbutic habit were most subject to it, and they who fed on pork or lived in wet and low grounds. In some places only a few persons or families were seized, while in others all escaped. In some families it passed like a plague through all their children, in others only one or two were seized with it. Some were seized with it at such a distance from the infected, that it could not be conceived in what manner they could receive the disease by infection. Some families had the disease mildly, while others, in the same place and at the same time, had a most violent sort."

*In a letter of Dr. J. C. Warren reference is made to "a treatise of Dr. Douglass, of Boston, on this subject" of the date of 1736. I have not been able to meet with the work.

“Ever since it came into the part of the country where I live (now about 14 years) it frequently breaks out in different families and places, without any previous observable cause; but it does not spread as it did at first: sometimes a few only have it in a considerable neighborhood. It seems as if some seed or leaven, or secret cause, remained wherever it goes; for I hear of the like observation in other parts of the country.

“In different years, and different persons the symptoms are various. In some seasons it has been accompanied with miliary eruptions all over the skin; and at such times, the symptoms about the throat have been mild, and the disease generally without danger, if not ill treated.”

Such is the earliest record I have seen, by an actual intelligent observer, of the disease on this continent; and it tallies accurately in all respects with more recent observation. As now, so then, it varied in the violence of its attack, in the absence or presence of eruption, and the degree of mortality; and then, as now the different forms prevailed simultaneously and separately, and there were periods of epidemic prevalence with occasional cases occurring sporadically. The same uncertainty marks its commencement and mode of propagation.

The next earliest notice of the disease on this continent by a medical author that has met my eye, is an exceedingly interesting manuscript tract on the subject, by Dr. John Kearsley of this city, now in the possession of Dr. George W. Norris. He says: “In the spring, summer and autumn of 1746,” nearly ten years from the time of its first appearance at Kingston, “and indeed some part of the winter of the same year, this disease since called, by the learned Huxham, Fothergill and others, the angina maligna, or the putrid and ulcerous sore throat, prevailed in this and the neighboring provinces, and spread itself with mortal rage in opposition to the united endeavors of the faculty. Like to some new diseases, till their nature and constitution are known, it swept away all before it. It baffled every attempt to stop its progress, and seemed by its dire effects to be more like the drawn sword of vengeance to stop the growth of the colonies, than the real progress of a disease. In the New England Governments, as their annals no doubt will show, the stroke was felt with great severity. Villages were almost depopulated, and parents were

left to bewail the loss of their tender offspring, till Heaven, at last, whose almighty power we all must own, graciously checked its baneful influence. This disease as it then appeared, and since within these few years, had most of those symptoms to characterize it which those learned gentlemen, we have mentioned, have handed down to us. With us it generally affected children, or those under puberty, whose lax solids and spongy habits were more fitted to receive the floating miasmata of a putrid atmosphere, than those whose textures are more solid. It also affected those who lived in low, wet, marshy places, more than those who lived in higher situations. It happened with us, as it did with them in England, after much cold wet weather, succeeded by heat." At this period we find the burials in the grounds of Christ Church, rising to a number even greater than those in the year 1741, in which a pestilence, the nature of which is not recorded, prevailed in the city, and by the law that more than one form of epidemic disease is never prevalent at one time, we are justified in attributing this great increase of mortality to scarlet fever. I have derived these statements respecting the prevalence of the disease in this country, chiefly from Webster's elaborate work on Epidemic Diseases, which exhibits the dates at which it prevailed, and the general mortality of each year, without giving any minute detail.

That this disease should affect both sexes equally might be reasonably inferred from the want of any circumstance, which should cause one to be more liable to its influence, than another. From partial observations, varying conclusions on this point have been reached by different authors. I need not now inform you that no accurate results can be obtained by the most carefully arranged tables, unless the observations be conducted on an extensive field. Unhappily for humanity, as well as for the scientific character of our country, the efforts made by the medical profession to arouse attention to the importance of an uniform system of Registration, have not yet accomplished an object so earnestly to be desired. We are, therefore, compelled to resort for extended statistical statements to foreign states. Thus while the private observation of Dr. Tweedie in London leads him to assert, that it is more common in girls; and from the same source, Rilliet and Barthez reach the conclusion, that it is more common in boys, and Dr. J

F. Meigs thinks it "probable that while under puberty, it attacks the two sexes with about equal frequency, and after that age it is most common in females," the reports of the Registrar-General of England and Wales, quoted by Dr. Gregory, show that in 1838, it destroyed, in London, 747 males, and 777 females; in 1839, 1214 males, and 1258 females. Throughout England and Wales (exclusive of the metropolis) in 1840, 8927 males, and 8935 females. Though in each of these statements there is an excess of females over males, it is so small a fraction of the whole number, that it cannot fairly be ascribed to any especial liability of one sex to the complaint. If the one sex were more subject than the other, to the disease, the difference would be more marked. Extended observation would in all probability change the result.

But while I believe sex exerts no influence over this disease, the relations which *age* bears to it are very important. It is decidedly a disease of childhood, and that, not because all persons are exposed to it in the earlier years of life, and those who are susceptible take it then and lose their liability, but because there is something in the condition of the system during infancy and adolescence, which renders those periods of life especially subject to the disease. Thus you will find that Dr. Kearsley and Mr. Colden both refer to the fact, that the force of the epidemics they witnessed fell upon children, and attempt to account for this fact, though it is supposed the disease then first invaded the colonies.

LECTURE IV.

Though it be true that scarlet fever is in an especial degree a disease of infancy and childhood, all ages are, to a certain extent, liable to it. The reports of the Registrar-General of Great Britain are exceedingly interesting from the extensive field of observation they cover, and furnish us with the most important information on this and similar points. Thus, with regard to the point which now claims our notice, we find that during the months of January and February, 1840, there were 345 deaths from the disease,

in London. Of this number 326 were under thirteen years of age, and 19 only were adults. And of 2614 deaths included in his fourth report for the Kingdom, 2429 were children, 182 adults, and 13 aged persons. Now, when we take into view the commonly conceded fact that the proportionate mortality of adults is much greater than of children, the real difference in liability will be found to exceed that which appears to be represented by these numbers, great as it is.

Dr. George Gregory says: "This is one of the few diseases to which the fœtus in utero is liable. On the 28th of April, 1839, my youngest son was born, evidently suffering under some form of fever. The throat was affected on the following day, obviously from angina maligna. Eruption was never developed. The child drooped and died on the first of May." As no attempt is made to show that the mother was laboring under the disease at or shortly before the birth of the infant, and it is not even asserted that it was prevalent in the neighborhood or family, there is great room to doubt the accuracy of the decision, that this was a case of scarlet fever. That persons at the other extreme of life may suffer from it I know, having seen it prove fatal in a lady, certainly not less than fifty years old.

Negroes are equally liable to this disease with whites, and dark as may be their hue, there is a peculiar change produced in it by the eruption where that is present, which is the result of the mingling of the florid tint with their peculiar color. When sudamina occur their appearance is very marked on the dark surface. The symptoms do not vary from those of the white, nor is the mortality greater.

Before we dismiss finally the consideration of the nature and laws of the specific cause of this disease, it is proper to draw your attention to the well established fact, that it is one of those to which we are liable but once. Dr. Willan, whose opportunities for observation were unusually great, and whose authority is beyond question, says that in more than two thousand cases which passed under his notice, he never met with a second attack. Dr. Tweedie asserts that there are well authenticated instances, but does not speak of them as of his own knowledge. No instance of a secondary attack occurred to Dr. Chapman, in his large and long extended observation. Dr. Currie, of Liverpool, was compelled by long experience to "renounce the

opinion he had early entertained, and to confess that the same individual is liable to the disease once only." Sir Gilbert Blane, on the other hand, asserts that he met with one instance of scarlet fever occurring thrice "without the least suspicion of ambiguity." Analogy favors the idea that in this, as in all other diseases, there are such exceptional cases. At an early period of my professional course, I thought I had met with them frequently myself. Longer and more careful observation has convinced me that, in many instances, I had mistaken other diseases for scarlet fever, misled by the similarity of the eruptions. There is a form of eruptive fever caused by indigestion, closely resembling this disease in its appearance, and like it making its invasion very suddenly, which is often met with in childhood. Such cases have undoubtedly been mistaken for scarlet fever, and have given rise to some of the reputed instances of second and third attacks. When occurring in the case of a child with enlarged tonsils, which are liable to acute inflammation from cold, or disordered stomach, the resemblance to scarlet fever is very close.

Secondary attacks may, however, occur, though less frequently in this than some of the other exanthematous fevers. A medical friend of great eminence has informed me that he lost a member of his own family by a second attack. The first was, when the child was but four years old, was irregular in its character, the eruption imperfect, and not followed by desquamation. There was an abscess in the neck, and long continued ill-health succeeded. After an interval of five years, the second and fatal attack supervened. There was but little affection of the throat, but the rash was very vivid and extensive, and death occurred from exhaustion of the vital forces by the intensity of the febrile reaction. Another medical friend has assured me that a well-marked second attack occurred in his family.

In this disease, as in variola and measles, second attacks are more frequent in those who have suffered from it in its most severe forms, than when in the first instance it has been mild. It would appear as though, in these persons, there was a greater degree of susceptibility to the influence of the contagious principle or epidemic miasm, while there are others in whom this liability exists but slightly at any period of life. This difference of susceptibility to the influence of the causes

of disease, is one of those mysteries which it is but little likely we shall ever be able to solve. That of a given number of persons, equally exposed to an epidemic influence, only a small number will yield to the impression, is well known; and contagion itself finds the same exemption in kind, though not in degree. More extraordinary still, is the fact that this susceptibility varies in the same individual, at different times, without our being able to recognize the circumstances on which the fluctuation depends. Present exemption affords no security from future liability. Thus it can hardly be supposed probable that the two gentlemen who fell victims to it when more than forty years old, to whose cases I have already referred under another head, had never been exposed to the cause previously. About the same period, one of our most respectable physicians died from the disease. He had been many years engaged in a large practice, and must have encountered the complaint frequently, and been subject not only to the epidemic influence, but to direct contagion. In such cases the susceptibility must either have been recently developed, or some unknown power had caused it to lie dormant for years.

In this respect the laws of scarlet fever are perfectly consonant with those which govern the diffusion of other kindred diseases. Thus, Dr. Watson records an instance of fatal small-pox in the person of a lady beyond 70 years of age, who had nursed two generations of her descendants in the disease, and was therefore very naturally thought to possess an entire exemption from liability to it. There is a certain amount of susceptibility which is always present even in the persons of those who have formerly had the complaint, as is evidenced by the sore throat which affects those who are engaged in nursing persons sick with this disease. Such cases may indeed be considered as instances of secondary affections, especially as I have already proved that they are capable of propagating the disease. There is one fact connected with this branch of the subject which deserves to be impressed upon your minds, as it will naturally suggest important precautions. You will often find an error in diet, exposure to cold, or undue fatigue, prove the direct agent in exciting the disease. In such instances it is manifest that the specific cause was present in the system, but kept in subjection by the conservative force, until some accidental circum-

stance disturbed the balance of health, and afforded the opportunity for development which was needed. To caution persons against such exciting causes when the disease is prevalent in a neighborhood or has invaded the family circle, is, therefore, the duty of the physician.

The *mortality* of scarlet fever varies greatly, occurs at different periods of the progress of the case, and depends on various causes. The *prognosis* is therefore necessarily indefinite. So treacherous is the disease, and so liable to serious complications and fatal sequelæ, that it is best always to give a guarded opinion as to the result. You may say, with safety, that no case is so desperate in its symptoms as to shut out the hope of recovery; but must at the same time admit that none is so benign as to exclude anxiety. I still remember perfectly a lesson learned in the earlier part of my professional career. I was attending the child of a clergyman; of course, therefore, an object of attention for a whole congregation. The case was one of the mildest I had ever seen; scarcely any anginous affection, the rash florid, the nervous centres unaffected. The progress of the disease was regular till the fourth day. It was a Sydenham case, "scarcely worthy the name of disease." Under these circumstances I ventured to congratulate the mother on her happiness. The disease was making fearful havoc in many families; she would be exempt thenceforth from the apprehension in which she had participated with all parents. The case became complicated with laryngitis, and, forty-eight hours after, the child was a corpse. I have, on the other hand, seen a patient lie utterly unconscious of surrounding objects, with a livid eruption, entire loss of the power of deglutition, constant discharge of putrid sanies from the mouth and nostrils, and uncontrollable jactitation—and others with convulsions and croup,—and yet recover. You will not, therefore, be surprised when I tell you that my uniform habit is to speak cautiously of the lightest, and to encourage hope in the gravest case.

There is no doubt that the mortality among adults is greater in proportion than among children. To pregnant and puerperal women, it is almost inevitably fatal. I have known several cases which proved mortal but have never heard of a recovery. The character of the prevailing epidemic should always be taken

into consideration in forming an estimate of the probable results of any case, as in no disease is the mortality more variable. This is proven by the personal experience of every practitioner. We may, however, refer to the report of the London Fever Hospital, given by Dr. Tweedie, as offering an illustration which cannot be questioned; 644 cases were treated in that institution during the twelve years from 1822 to 1833 inclusive. Of this number, thirty-eight died, being at about the rate of 6 per cent. upon the whole series of cases. But when we descend to the investigation of the annual mortality, we find that while, in 1829, the rate was as high as one in six, in 1832 it fell as low as one in forty. Dr. G. Gregory refers to the observations of a Mr. Ward of Bodmin, who reports four hundred and forty-two cases with thirty-six deaths; of these cases, three hundred and twenty-four were accompanied by the eruption, and of these, twenty-six died. While of one hundred and eight without eruption, ten died, thus making but a small difference in favor of those cases in which the skin is involved. Dr. Condie, of this city, reports two hundred and sixty cases, of children under 12 years of age, occurring during three epidemics of considerable extent and severity, with 45 fatal results. Dr. G. Gregory states that 6 per cent. may be assumed as the medium rate of mortality.

Though it be true, as I have before remarked, that the general character of the prevailing epidemic will throw light upon the probable result of the individual cases, it is right that you should know that there are exceptions to this rule. Not only do we find some cases of a very mild character occurring at the time, when the disease is generally malignant, but the reverse also takes place, though less frequently. You may adopt it as the general rule, that, whatever may be the prevailing type, the character of the first case which is seen in a family or school, will attach itself to all the subsequent cases. Thus the disease in the House of Refuge, was certainly very mild, no death having occurred, though the type of the epidemic, then prevailing in the city, was severe.

When, in forming your prognosis, you come to the consideration of the individual symptoms, I would caution you against placing any reliance on the extent of the eruption, as affording a criterion by which you may determine the degree of risk. I have frequently seen cases, in which the whole surface

was covered with a vivid rash, prove fatal, and equally often have known the ready recovery of those in which there was none, or but little around the joints or on the body.

Simple scarlet fever is certainly much less likely to result fatally than the anginose, and this less so than the malignant and congestive, or irregular. The occurrence of convulsions in any stage, or either form, is always an indication of great danger. I at one time thought them a certainly fatal sign, but I have known several such cases to recover. Violent delirium, manifesting itself by shrieks like those of meningitis, is also of bad augury, no matter how slight may be the affection of the throat; so also is stupor with grinding of the teeth. Croup is a very serious complication and should cause you to watch the case in which it occurs, narrowly. The enlargement of the neck without a corresponding degree of swelling of the tonsils and adjacent mucous membrane, is also of evil omen; especially when there is the acrid discharge from the nostrils, which indicates the existence of ulceration of the posterior nares. The continuance or increase of the febrile symptoms, after the fifth or sixth day, is also a bad sign, as it proves the existence of some local lesion. A dusky or livid color of the eruption is always a bad sign, whether it result from the deficient aeration of the blood, or some other cause; and so are great sighing, and a feeling of faintishness, and hurried respiration. Ulceration of the commissures of the mouth and eyelids are unfavorable events, and so are coldness of the surface, whether it be dry, or bedewed with moisture.

The subsidence of the frequency of the pulse, and the diminution of the redness and swelling of the parts about the throat, in the anginose variety, are circumstances which should afford encouragement. Among the favorable signs, none should be hailed with greater satisfaction than a warm perspiration; whether it is found in the simple, anginose, or malignant form. Next to this is the diminution of the heat of the skin, with or without moisture, provided it do not descend to a degree of coldness less than the standard of health.

Death may result from various causes, and at several stages of the disease. The violence of the primary shock may be such that the system may not react from it, or the reaction may be

so severe as to prove fatal. The nervous centres may be so deeply impressed that death shall ensue from the destruction of the balance necessary to their healthy action. From any of these causes it may occur within the first week of the disease; nay, even within the first twenty-four hours. Dr. G. Gregory thinks sixty hours, or the third day, the period of greatest danger. But even when the first week has passed, and the primary symptoms have yielded, the causes of mortality still stand thickly around the course of the patient. Inflammation of the larynx, the pericardium, or the kidneys, may be developed and produce a fatal result; or the patient may die from effusion in the ventricles of the brain or the thorax, or from the long continued exhausting effects of abscesses or diseases of the bones.

Each of these latter causes of death will of course leave a corresponding lesion in the organ affected. But in those cases where death has occurred in the early stages, it would be irrational to expect to find any morbid appearances in this, more than other pure febrile diseases. The fatal impression has been made on organs which express their changes by signs which pass away with life and leave no trace behind; but by some authors the brain is said to be more vascular than natural in cases where there has been very violent delirium, and instances are reported of increased vascularity and opacity of the arachnoid. We are not informed at what period of the disease death had occurred in these cases. In the malignant and anginose forms we shall of course find the traces of the disorganization of the mucous membrane of the fauces and adjacent parts which has been noticed during life, and I have seen ulceration of the mucous membrane lining the larynx, and abscesses about the cartilages.

Though there can be no doubt that the blood during life is much changed from its healthy condition, there is nothing peculiar in its state after death. It is reported to have been found sometimes fluid, at others abounding in coagula, sometimes collected in especial organs, and at others more equably distributed. The proportion of fibrine is said to be slightly in excess in some instances. This would result from any local inflammation which might be set up on the progress of the case. The spleen in some instances has been found enlarged, soft and reddened.

There are several *complications* which are met with in the dif-

ferent forms of scarlet fever, with which you should be made familiar. The sore throat in the anginose forms, varies in degree, and is often attended by swelling of the glands of the neck, impeding deglutition, even in some cases to the extent of entire interruption. It is by no means an uncommon event for the food and drink to be returned through the nostrils, instead of passing into the œsophagus. Ulceration of the mucous membrane, and even sloughs of the subjacent parts are found in extreme cases. Delirium is by no means an unfrequent attendant, and may be either wild and violent, or of a low muttering form. In the former case, which is confined to the simple and anginose varieties, it is frequently associated with convulsions; in the latter, which belongs to the malignant, with coma. Laryngitis is another serious complication which may occur in either form of the disease, and at any stage of its progress, and is always a formidable symptom. Violent rheumatic pains in the limbs are occasionally found in the earlier stages, as well as among the sequelæ, and there is often more or less muscular rigidity of the neck.

Ulcerations of the mucous membrane of the nasal passages, and the extension of the inflammation through the eustachian tube to the internal ear, are also met with in some cases, giving rise to the most intense suffering at the time, and involving the disorganization of the organ of hearing. Pneumonia *may* also occur in this disease, but more frequently violent affections of the heart indicated by labored respiration and distress in the præcordial region. Dr. Gregory describes the case of a lady "who was seized with scarlet fever at the time of parturition. The labor was long and severe; she perspired profusely; the heart labored violently. The next day scarlet fever appeared. The heart exhausted by previous efforts gave way, and in about fifteen hours from the appearance of the eruption, became engorged. A frightful feeling of suffocation supervened, and the pulse for a few minutes was imperceptible at the wrist. This feeling subsided, but the heart never regained its natural condition. Dyspnœa increased, and in twenty-four hours more, the blueness of countenance and incipient delirium showed that the lungs were implicated, and that waves of ill oxygenated blood were permeating the brain. Twelve hours longer of this semi-asphyxiate state closed this sad and painful scene."

The *Diagnosis* of scarlet fever is, you will perceive, not devoid of difficulty, and is yet always important. The anxiety of parents is excessive. Often, very often, have I been called at a late hour in the evening to see a child, suddenly seized with fever between the time at which it had been put to bed, and the hour at which the parents retired. The flushed cheek and restless sleep had excited the apprehension of a mother, some of whose friends had suffered from this devastator of the nursery. The power of allaying these fears by the positive assurance that no such danger was impending, is one of those which will afford you as much gratification as any you can exercise. Your own satisfaction in the treatment of a case is also much enhanced by certainty as to its character. Circumstances may also arise, in which it is most important to be able to give a prompt decision. I once, needlessly, caused the dismissal to their homes, of the children of a boarding school, thus spreading alarm into many families, and interrupting the pursuits and materially interfering with the interests of a most worthy family, by the hasty and erroneous determination that one of the children had scarlet fever. The opposite error might have been still more disastrous in its results. Let me, therefore, impress upon you the importance of a careful study of the signs of distinction. The well marked anginose and malignant forms can not be mistaken. It is only in the simple and irregular cases that we are liable to error. These, however, you remember, may give origin to the most violent and fatal forms, and even the mildest cases may become serious in the results, if not properly treated. In every case where there is a sudden invasion of fever with sick stomach and the occurrence of rash within forty-eight hours, you should *suspect* scarlet fever. Let this suspicion be your own, however, until you have carefully investigated the entire history of the attack, and examined well the symptoms, bearing in mind that important results may follow your decision.

There are several diseases which may be mistaken for simple or anginose scarlet fever. Measles, you know, was long confounded with it. Sore throat with fever resembles it in some points. The rash which often accompanies indigestion in children is very like it. There is a very mild form of disease, known

popularly by the name of "the scarlet rash," which closely resembles it, and roseola has often been taken for it by superficial observers.

There are several points of difference between Measles and Scarlet Fever noticed by authors. The period of incubation is said to differ. When, however, you reflect on the impossibility of determining the time of exposure in many cases, and that when this is known, the mere fact of exposure will determine the nature of the case, you will at once perceive how little benefit can be derived from such an observation. I have, moreover, already shown how very uncertain is the period of incubation. It is quite certain, however, that measles has never been known to occur so promptly after exposure as scarlet fever.

The time, after the development of febrile symptoms, at which the eruption occurs in the two diseases in those cases which pursue a regular course, is very different. The rash of scarlet fever is observed often simultaneously with the febrile invasion, and generally within twenty-four hours; that of measles does not show itself in less than seventy-two hours, or on the third or fourth day. The invasion of scarlet fever is marked by nausea or vomiting, thus fixing the stomach, and passages which lead to it, as the organs involved. The first stage of measles, on the other hand, is indicated by catarrh, sneezing, redness of the conjunctiva cough and hoarseness; thus exhibiting the tendency of the disease to fix on the mucous membrane of the air passages. This difference in the local tendencies marks the whole course of the disease and its sequelæ.

There is also a marked difference in the appearance of the rash. The eruption of measles may be first seen about the roots of the hair and behind the ears; in circumscribed well defined spots, which as they spread, assume frequently an arrangement which has been called crescentic, several spots being grouped together and surrounding patches of skin of perfectly natural appearance. From the face, it gradually extends itself downward over the whole person. In the regular course of scarlet fever, there is a vivid efflorescence covering the whole surface of the head and neck simultaneously, and often even the whole trunk, leaving no spot unaffected. The papular eruption scattered through the efflorescence of scarlet

fever, which gives the appearance of stigmata, noticed in the description of the disease, is unknown in measles. There is a marked difference also in the color of the rash of the two diseases. In scarlet fever it is of a florid or vermillion tint; in measles there is at the very outset a dull lake color. The first declines by fading away; the last becomes darker or more dusky.

In the sequelæ of the two diseases, we find the most striking evidence of their diverse origin and nature.

In scarlet fever we have affections of the brain, the kidneys, the cellular tissue, ulcerations of the throat and ears, and abscesses about the neck, rheumatic pains, and if any of the affections of the air passages occur, it is evidently by mere extension from the adjacent parts. In measles we have bronchitis and pneumonia, and sometimes diarrhœa. But while there are these important and well marked points of difference between the two diseases, it must not be concealed that you will occasionally meet with instances in which your efforts at discrimination will be tasked during the progress of the case; and it is even possible that in some there may be a mongrel disease, as though it were the result of a mixed influence; commencing as scarlet fever and yielding in its course to the influence of rubeola. There is often in cases of variola or varioloid a diffuse efflorescence on the second or third day which very closely resembles that of scarlet fever, and the resemblance is rendered more embarrassing by the sore throat which so generally occurs in variola. It may be distinguished from it by the character of the febrile symptoms which accompany it. The restlessness and gastric oppression and pain in the back, of the variolous disease, sufficiently mark its character, and are never present in scarlet fever. Neither is there the frequent pulse to which I have drawn your attention, as belonging especially to the disease. That of the variolous impression is less frequent and softer, the absence of the dotted points which are interspersed through the efflorescence on the skin, and always appear in the throat, will afford assistance in determining the nature of the case. Attention to the symptoms affords one of the best points of discrimination in cases of eruption resembling scarlet fever which occur in the signs of indi-

gestion in childhood and infancy, and the best additional diagnostic sign I can furnish you is found by looking into the throat. The eruption of scarlet fever is *always* found there, if it affect the external surface. The appearance of the elongated papillæ through the white fur, is less to be relied on. I have been deceived by it. Not so, however, the appearance of the tongue on the second or third day. The sudden throwing off of the coat of fur, while the surface is left red and glossy, is decidedly characteristic and will never deceive you, as it occurs in no other disease at this early period.

The eruption which occurs about the third day of typhus fever, bears a closer resemblance to that of measles than to the one now under our notice. The age of the patient will afford aid in forming an opinion, typhus fever being more frequent in adult life, and scarlet fever in infancy and childhood, while the history of the case will always enable you to trace genuine typhus fever to its origin in direct contagion or exposure to the peculiar circumstances which give rise to it.

LECTURE V.

Such are the phenomena which usher in, and mark the progress of, scarlet fever; and such the primary results of its impression on the human system. We are now prepared to arrive at some conclusion as to its character, which may be thus expressed.

Scarlet fever is a febrile disease, dependent on a specific miasm, resulting from unknown external influences; yet capable of reproduction, and diffusing itself, both by direct contagion and by the establishment of a peculiar condition of the atmosphere within limited districts: the susceptibility to the influence of this cause varies in different individuals and at different periods of life, and is generally exhausted by one attack: the morbid impression is made on the nervous system, and transmitted to the circulating fluids through which every part of the organization becomes subject to the influence, while the principal localization of diseased action is in the capillaries of the skin and mucous membrane,

We now proceed to the consideration of certain results of this impression, which are more durable than the disease itself; quite distinct in their character, equally, perhaps more, to be deprecated than the primary disease.

It can scarcely be necessary to add any thing to the remarks already made on the subject of the affection of the throat, when treating of that symptom in the description of the anginose and malignant forms of the disease. It occasionally happens, however, that the ulcerative process set up from the very commencement of the case, continues long after the scarlet fever has run through its regular stages; and extends itself upwards into the posterior nares, or downward into the pharynx, or even invades the larynx.

Disease of the ear may either occur during the course of the primary disease and be prolonged after that has reached its termination, or may be first manifested even some weeks after the scarlet fever has seemingly disappeared. It is sometimes ushered in by a rigor and deep seated pain, followed by purulent discharge, and at others, is first manifested by discharge from the

you said: yes.

external meatus of a thin apparently serous fluid, which soon takes on the appearance of unhealthy pus.

The cases which thus manifestly originate in the membrane lining the external meatus generally yield speedily to appropriate treatment; while those which are dependant either on the transmission of the inflammation along the Eustachian tube, or in which that process has its commencement in the internal ear, are of a much more serious character. In either case permanent deafness may result; if both ears are affected, reducing the child to the condition of a mute. I had a case some years since in the person of a fine healthy boy of about eight years old, in which the primary symptoms were all of the most aggravated character. The swelling of the throat and ulceration of the mucous membrane of the pharynx and nares were very extensive. As the primary disease subsided the irritative action of these local lesions took its place, prolonging the duration of the case for many weeks. Finally, a chill, followed by intense febrile reaction and extreme pain in the ear, announced the extension of the disease to the internal ear. Stupor, interrupted with violent shrieks, like those which occur in acute meningitis, supervened: suppuration was established, and the matter found its way to the surface by the external meatus, and by an abscess over the mastoid process, evidently connected with the cells of that portion of the temporal bone. Caries of the bone followed, which continued for several years, and though the general health of the child was in great measure re-established, nothing had any influence in arresting the disease of the bone, which continued to extend itself until ultimately it reached the membranes of the brain, and he died of acute meningitis.

Croup may also occur as a sequela of scarlet fever, as well as during the primary stages of the disease; in either case a most formidable complication. Some years since one of my patients survived an attack of scarlet fever in which every complication and sequela of the disease appeared to conspire for her destruction. The disease was ushered in by convulsions. There was extensive sloughing of the soft palate, and then as late as the tenth day the hard croupal cough gave evidence of the invasion of the larynx. I attempted the application of the solid nitrate of silver to the part, when to my infinite dismay a large portion

was broken off by the child in its struggles and swallowed. I said nothing of the accident to the parents at the moment, but calling for the salt cellar, promptly administered a strong solution of the muriate of soda. This not only decomposed the nitrate of silver but acted as a speedy and efficient emetic, and very probably saved the child's life, by the vomiting induced, as to my great surprise it recovered.

Still more frequently, the lymphatic glands of the neck become implicated, and serous effusion into the cellular tissue beneath the jaw impedes the deglutition and respiration, and either accelerates the fatal catastrophe, or produces the formation of large collections of pus, which may give rise to hectic irritation, and result in death after prolonged suffering.

The 2d class embraces lesions, which are more general in their character; among which the first place in importance as well as in order of time, must be assigned to that destruction of the epidermis by the cutaneous inflammation which gives rise to the process of *desquamation*, to which reference has been already made. It may be indeed a question well worthy investigation, how far other sequelæ, inflammation of the kidneys, and dropsical effusions, and inflammation of the membranes of the heart, may be dependant on this interruption of the functions of the skin. Certain it is, that all these sequelæ are observed to follow more frequently those cases in which the affection of the skin has been most decided. Some authors make a contrary assertion; but my own observation is very positive on this point. Thus in the malignant and irregular forms of the disease, the mortality is greatest in the first week, or results from the injury done to the brain or nervous system, by the direct onset of the disease. While in those mild cases of the simple form in which there is abundant efflorescence, with high febrile reaction, death, if it occur at all, is produced by the dropsical effusion, or some of the other secondary affections, as those of the heart or brain. When the rash has been very vivid, and the heat and dryness of the skin corresponding, the destruction of the epidermis is most decided; and most writers agree in testimony, that in such cases, there is more reason to apprehend the occurrence of serious sequelæ, while in those cases in which the rash does not appear, it is but slight, or recedes soon after its appearance; the

functions of the skin being less disturbed, the convalescence is less frequently interrupted by the occurrence of dropsical effusions, or of inflammation of the membranes of the heart, which prove the most fertile sources of danger after the first stage of the disease has been safely passed through. You must also bear in mind the fact that the disease of the skin is more strongly marked in the simple and anginose than in the malignant or irregular forms, and all writers coincide in the declaration that the sequelæ are more usual in the mild and regular, than in the severe and irregular cases.

The importance of the skin, and the influence upon the whole economy of the mode in which its functions are performed, cannot be too strongly impressed on your minds. We all are conscious of the effect on our own sensations arising from the arrest of those functions, by whatever cause it may be produced; and you know every feeling of discomfort is only an indication of a deviation from health. This, however, does not make so strong an impression on your minds as the facts which are proven by observation on the results of the healthy action; when for example, you estimate the influence on the circulating fluids which must be produced by the twenty-eight miles of "perspiratory tubing," with its seven millions of pores opening through the epidermis, discharging daily two ounces of excrementitious matter, and not less than thirty ounces of watery vapor, you can better appreciate the effects which must result from the entire interruption of this excretion, produced by the drying of the cuticle through which those pores are transmitted: nor must you forget that this excretory process is not the only one which is going on through cutaneous agency. From the teacher of Physiology you will learn how large is the amount of influence on the blood, subsidiary to that of the lungs, exerted by the direct imbibition of oxygen through the skin. Now if you bear in mind the activity of the vital processes, and that no one of them is needless, but each absolutely essential to the other, and to the integrity of the whole organization; and then remember that by the destruction of the cuticle not only the depurative action is arrested, but an obstruction placed on one channel, by which the vitalizing influence of oxygen is introduced, you will be better prepared to appreciate the con-

dition of the blood, and the consequent danger to the patient, in scarlet fever, from this cause. It is, moreover, a fact well established by the observation of surgeons, that in burns and scalds, the danger is proportioned less to the depth of the injury and the intensity and duration of the heat applied, than to the extent of surface involved, thus affording additional evidence of the importance to the system of the cutaneous function. Nor must you overlook the fatal results which have been produced, on animals of a lower grade, by coating the skin with some impermeable material. Now in this disease the whole surface is affected, and more decidedly than in any other of the exanthemata, except confluent small pox. In rubeola there are patches of healthy skin; in erysipelas the extent of surface involved at one time is much smaller, and neither of these diseases leaves the dead cuticle to impede the normal action of the new. You will not, therefore, be surprised that when treating of the inferences, as to the final result, to be drawn from the symptoms of the disease, I cautioned you against the common error, of supposing that the freeness and extent of the cutaneous affection was a favorable sign; and will understand why I thus draw your attention to the desquamatory process and place it first among the sequelæ of the disease; and will also be the better able to comprehend why the mortality is often greater in the secondary than the primary stages. So decidedly is this the case, that common observation has taught it. When on one occasion I assured an intelligent mother of a large family, several of the children having been attacked simultaneously, that the crisis of the disease was passed, she replied: "well, then this is the period of danger; Mr. ———, who lost several children with it, told me that they all died just as the doctor told him they were getting well."

This, then, is the period in which your anxieties should be especially active and your care most vigilant; and the danger to the patient is connected with, if not wholly dependent upon, the interruption to the healthy action of the cutaneous emunctories. The process of casting off the cuticle, which we observe, and to which this term *desquamation* is applied, is not itself a diseased process, but the effort to get rid of an impediment to the normal action of the system. Commencing from the time at which the cuticle is destroyed in favorable cases, in others it is post-

poned, sometimes even for a fortnight. You will always find the peril proportioned to the tardiness with which it is accomplished ; and until it is completed, you will find your patients depressed by the poisoned condition of the blood, and liable to the sudden development of cerebral disease or inflammation in some organ essential to life. But the external cuticle is not the only organ for exhalation, the action of which is in a similar manner suspended or destroyed by the disease. You are of course aware from observation on your own person, and have been taught to apply this observation to its relation to disease, that wherever any influence from *without* arrests the cutaneous transpiration, a corresponding increase is found in the watery constituent of the secretion from the kidneys. This is not the case, however, in diseases where the same cause certainly operates equally on both kidneys and skin, and produces a similar result in each. Hence you will find, that though the amount of urine has been but little diminished during the four or five first days of scarlet fever, it is either wholly arrested or becomes very scant about the same time that the functions of the skin are most impeded. The same is true in other febrile diseases, in most of which, you will find the excretions through the skin and kidneys are not antagonistic as in health, but are either suppressed or increased in freeness under the influence of some common cause. The occurrence simultaneously of increased discharges from both organs is noted as marking the crisis of febrile diseases. Now it is not at all a forced idea that the same diseased action may be established in the Malpighian bodies and epithelium of the kidneys, as is observed on the external tegument ; and it is well known that the flow of urine is always much diminished about the time at which the process of desquamation is at its height, and I believe epithelial scales are found at this juncture abundantly in the urine. The facts observed therefore, confirm the suspicion which might be entertained from reasoning only, that there is such a connexion between the diseased condition of the skin and kidneys, in their influence upon the other sequelæ of scarlet fever, as justifies the relation which I have ventured to suggest before ; and indicate the latter organs as equally interested with the skin in the production of some of the results which will claim your attention immediately. Whether the

diseased condition of the kidneys be dependant on the interruption of the functions of the skin, or both organs are simultaneously affected by one common agency, I am not yet prepared to decide positively. Certain it is, that dropsical effusions occur in a very large proportion of cases of regular scarlet fever, frequently, in despite of all precautions, always if care be not taken to prevent exposure to atmospheric vicissitudes or errors of diet. The more regular the course of the case, the more vivid and abundant the eruption, the more certainly may this desquamation be expected, and its consequences, dropsical effusion, be looked for.

The external cellular tissue affords the most common seat for the serous effusion. It may take place, however, into any or all the cavities of the body from the ventricles of the brain or pericardial sac, or cellular structure of the lung, to the tunica vaginalis testis.

The actual effusion of fluid is generally preceded, a longer or shorter time, sometimes only four or five hours, in other cases, for a day or two, by feelings of languor and drowsiness, loss of appetite, nausea and vomiting, coated tongue, and great heat and dryness of the skin: the pulse is tense and corded, with a return of the frequency if that had subsided. From the end of the first week to the beginning of the third, is the period at which these symptoms are most frequently developed. Though no amount of precaution can wholly remove the liability to the result, it is by no means uncommon to find it brought about by improper exposure to atmospheric vicissitudes, or some error in diet; and it is to the neglect of care in these points, resulting from the idea that the disease has been too mild to require it, we may ascribe the greater proportionate frequency of dropsy after the mildest cases of simple scarlet fever.

The present will probably be as appropriate a place as any that may offer to impress on you the importance of enforcing the greatest care with regard to this exposure, and indulgence of appetite, since it is sometimes very difficult to make those who have not purchased their own experience by a severe lesson fully aware of its necessity.

In the year 1830, I was sent late at night, by the late

Dr. Dewees, to see the family of an officer of the Navy, in which five of the children had been under the care of another physician, with mild scarlet fever. He had seen them in the morning, pronounced them well, and had given his consent to their being allowed the free range of the house and the usual diet of the family. When I reached the house, two of the children were already dead from convulsions, and the others were saved with difficulty, having fever followed by anasarca, depending, in all probability, on inflammation of the kidneys, the result of the exposure of the day. No examination of the bodies was permitted, but the deaths were undoubtedly owing to effusion of fluid within the cranium. Dr. Chapman describes similar results as having occurred under his own observation.

In another instance I was attending a child from South Carolina at lodgings here, which was carried happily through a mild attack, with but little treatment except of a preventive character. An older daughter of about 18 was taken sick after I had ceased my attendance in the first case. The symptoms were so benign, and the treatment I had adopted had been apparently so nugatory, that the family were induced to believe the disease was but little to be dreaded, and required no care whatever. They, therefore, did not seek medical advice in the second case, and permitted her to pursue her usual habits, as regards diet and exposure; at the end of a fortnight I was sent for to prescribe for general anasarca for which they were at a loss to account. Warned by these and similar instances, some of which I shall refer to when treating of other sequelæ, I am always earnest in my endeavors to impress on the parents of scarlet fever patients, the great importance of care on these points, until the entire process of desquamation has been completed; and this care is more especially important, at the very juncture when it is least likely to be exercised, just at the close of the process, when the condition of the blood caused by the arrest of the secretion from the skin and kidneys is at its worst point, and the new cuticle most tender and liable to the impression of cold air. The effusion is generally first observed about the face and hands. The complexion suddenly assumes a less healthy hue, resembling that of anemia, the eye lids are observed to be somewhat puffy, and upon attempting

to flex the fingers they are found to be stiffened. The trunk and upper parts of the lower limbs next assume the appearance of disease, and on feeling these parts they are sensibly harder to the touch than natural, and there is often some complaint of tenderness on pressure, which, moreover, does not leave the indentation found commonly in anasarca. All these circumstances agree in the indication that the skin itself is in fault, and that the disease is not one of mere infiltration, caused by some affection of the viscera, or destruction of the crasis of the blood. The suddenness with which this swelling follows exposure, also confirms the same view, as I have known it to be manifested almost immediately on the return from a drive, or exposure at the door or window, or other similar imprudence. The bowels are generally costive at this time, and even though the secretion of urine may not before have been so much diminished as to arrest attention you will now find, if you make enquiry, that it is very scanty, high colored, and turbid. Those who have made critical examination of this fluid under these circumstances report it to contain blood, and albumen, and to be very acid. At one time this was thought to indicate the existence of the incipient stage, that peculiar condition of the kidney, found in cases of what is known as Bright's disease. This is, however, an error. The presence of albumen in the urine as indicated by the deposit of that substance coagulated by heat or nitric acid, is often dependant on simple inflammation or perhaps congestion only of those organs, and this is undoubtedly the case in the instances under consideration. In Bright's disease the quantity of the urine is increased, its specific gravity diminished, its color light: in all these respects presenting a marked contrast with the condition of the secretion in the dropsy following scarlet fever. The examination of the bodies of those who have died of scarlet fever, as reported by MM. Rilliet and Barthez, proves that no such disorganization as that known to produce Bright's disease exists. It is true these authors do not indicate how many of their fatal cases had progressed to the period in which dropsy is developed, but they say that "in no case were the kidneys enlarged or pallid, though sometimes red or congested." There is no disease in which we stand more in need of accurate, well digested observations of post-mortem examinations. This

results from the fact that the mortality generally occurs in private practice, and the distress of parents and friends prohibits the physician from proposing anything which would aggravate their sorrow.

Anasarca is the form in which the dropsical effusion most generally presents itself. If it were the only one, the previous diseased condition of the cutaneous capillaries, and the generally acknowledged dependance of the disease on the impression of cold on the surface, would justify the belief which has been expressed by some authors that "it arises from increased action in the sanguiferous system."* Next to the cellular tissue beneath the skin in liability to this effusion, I should place the pleural sac or the pulmonary tissue; and after this in order of frequency, the ventricles of the brain and the pericardium, and I have no doubt that sudden death is caused in many cases by these latter lesions. An instance of this occurred in my own practice. An infant had been carried out by its nurse, apparently in perfect health. It was brought home in a state of collapse, and died in a few hours without reaction. Within a few days another child in the same family sickened with scarlet fever, and had a mild anginose attack with an abundant eruption. It passed through the first week safely, and was apparently convalescent, when an anxious grandmother, confident that it stood in need of more nourishment than I had allowed to be given, fed it largely with cakes, ice cream, and animal food. At the end of 48 hours of this injudicious treatment, the child was seized with general anasarca, with dry cough, dyspnœa to such a degree as prevented the child from lying down, and death speedily ensued. In this case there was pulmonary œdema and effusion into the pleura and pericardium. Dr. Hamilton reports three similar cases among the boys in a school in England, in which death took place within thirty-six hours, the symptoms indicating effusion in the ventricles of the brain, and the cavities of the thorax and abdomen, as well as in the cellular tissue generally. Cerebral effusion is certainly the most formidable of the sequelæ of scarlet fever, though happily less frequent than the anasarca. It is indicated by the occurrence of stupor, or violent headache and vomiting. The pulse is slow, one or both pupils dilated. Vision

*Tweedie, Cyclop. Pract. Med.

is impaired or even lost entirely, and there may be strabismus, or even general convulsions, or paralysis. The countenance is at the same time bloated, often excessively so.

Endo-cardial inflammation is another of the sequelæ of scarlet fever of a most formidable character, which you will find mentioned by most authors. It has only once met my notice. This was in the case of a lad of 12 years old. Scarlet fever in its mildest form had passed through a family of six children, of which he was the oldest and last taken. The most rigid attention to diet, and the greatest care to avoid exposure, had been practised; my attendance had been prolonged to six weeks, and as convalescence was fairly established, I had called in the evening to take my leave, and sat till a late hour. In parting I expressed my gratification at the result, for I can assure you, you have great cause for thankfulness when this disease assumes a form so benign as to pass through a family of that size, and leave the circle unbroken. The reply of the mother, was the expression of her fear that the peril was not yet entirely passed. The hearty laugh of the one that had last been sick, which was just then heard from the nursery, might have induced me to ridicule such apprehensions had I not known the treacherous character of the disease. Scarcely three hours had elapsed when I was summoned to see him with great dyspnœa, tossing about the bed unable to lie down, with a small tense pulse and hot skin. Bleeding, leeching, blistering, calomel, digitalis and colchicum, aided by the most anxious and affectionate nursing and rigid abstinence, carried him through this attack, but left him with an hypertrophied condition of the left ventricle, and disease of the valves, from which he has, however, since recovered.

Rheumatic pains, with fever, are of very frequent occurrence during the convalescence from this disease. It is often, though not always the result of premature exposure, and like the dropsical effusion, is more likely to occur in mild than grave cases. A fine healthy child was spending the summer months in the country where scarlet fever had not before prevailed. He had an eruption with febrile symptoms, but of so mild a character that the physician in attendance, remarked, he might have had scarlet fever, but that there was not sufficient disturbance of the child's

health to correspond with the amount of eruption, and his ideas of the disease. The little fellow was allowed to pursue his usual amusements without interruption. At the end of a week he complained that his "legs were too long for him," that he was "tired," became feverish and languid, refused food, lost the power of using his lower extremities, and died. This was an extreme case; more generally some time during the second week, there is a return of the fever, the pulse quick and corded, and the skin hot and dry; the child complains of pain in the legs, and cries when any attempt is made to move it. This state continues two or three days, and then yields to proper treatment.

Some authors speak of purulent deposits in the joints. This is a result which has never fallen under my notice.

Diarrhoea, when it occurs, is to be ascribed to the irritation of the putrid colluvies swallowed from the ulcers in the throat, rather than to any direct influence of the cause of the disease on the mucous membrane of the alimentary canal.

LECTURE VI.

Though it is undoubtedly true, that but few diseases are amenable to the influence of purely specific remedies, it is not the less certain, that general principles of treatment must be regulated in their application to each disease, by close observation of the peculiar character and tendencies which mark its own history. No habit can be more pernicious to the student, and less beneficial to the patient, than that so often adopted by superficial thinkers and indolent practitioners, of omitting the consideration of the causes which produce, and circumstances which influence, the progress of any form of disease; and filling the memory with modes of treatment and specific remedies which may be employed empirically, without endeavoring to understand the principles which should determine their adoption, and regulate their appli-

cation. There is no disease which more fully illustrates this common truth than that now under consideration. It is only from a careful study of its general history, as well as minute observation of the course of symptoms in individual cases, that any suitable idea of treatment can be deduced; and the liability to frequent change in the type of the disease, from simple and sthenic, to irregular and malignant, demanding a corresponding change in the mode of treatment, renders the success of the practitioner equally dependent upon the soundness of his general principles and the accuracy of his particular observation.

Preserving ever certain distinctive peculiarities which prove its identity, yet yielding continually to the influence of those extraneous impressions which govern its development at particular periods, the treatment to be pursued in Scarlet Fever must in like manner be regulated by one leading principle, while it is varied, not only by temporary or local demands, but often in accordance with individual peculiarities. You will find this view of the case has been too little regarded by those writers on the subject whose works are generally consulted by medical students. During some epidemics assuming a sthenic character, in others marked by a strong typhoid tendency; in some, complicated with severe local lesions, while in others, it pursues its course with but little tendency to any particular organ or structure; in some cases, pursuing a course as regular as the progression of the hours; while in others, it only touches at certain points on the confines of the disease, and assumes every conceivable variety of irregularity, it must be at once evident to you that no single remedy or simple plan of treatment could be set forth as appropriate to Scarlet Fever.

There is, however, one idea which should be ever present to your minds, as the regulating principle by which every plan of treatment must be conducted, and which shall place decided limits to the extent to which any course may be followed. Whatever peculiarities may mark the epidemic character, or vary the individual case, scarlet fever in all its varieties, is a disease which has a specific origin, a fixed course, and a certain termination.

There are some diseases in which every hour of continued pain, or disordered function, is a reproach to the skill of the physician;

since they are subject to properly applied remedies, and may, by them, be at once subdued. This, on the contrary, is one, the duration of which is fixed and may not be curtailed; and often its tendencies to local destruction may be only moderated, not wholly averted. This fact should never be lost sight of in this and the other kindred diseases which will claim our attention in succession; since he who should attempt to cut short the duration of scarlet fever, would find that it could be done only at the expense of the life of the subject. Even in guarding against local injuries, the same fact should be borne in mind; as, in a large majority of cases, these have a natural tendency to abatement with the decline of the primary symptoms. It was in all probability the observation of these facts which led Sydenham to express his celebrated caution against over anxiety and too vigorous effort; and by the same knowledge we are supplied with power to meet the empty claim of superior success in treatment, put forth with so much vain-glorious boasting by modern empirics. While some cases have a fatal tendency so strong that no skill may avert it, by far the larger proportion of simple and anginose cases need little more than the avoidance of impertinent interference, and the guarding against injurious impressions from without, and they will cure themselves. Let me not be supposed to advocate an indolent indifference, or to assume that no treatment is necessary. There is no disease which demands more watchful care, none is more influenced by skilful scientific practice. I would only remind you that medical science has other remedies than drugs; and caution you against the unscientific resort to empirical perturbative treatment which is certainly more to be dreaded than the morbid impressions of the disease itself. These general principles are applicable to all the various forms assumed by this disease, and must be ever kept present in your mind during the consideration of the various plans of treatment and specific remedies which will be passed in review.

In order to render it more easy for you to embrace the views it is intended to present to you, the same division of the disease will be adopted as was resorted to when describing it. Commencing with the mildest form as affording the type of its character and treatment, we shall be better able afterwards to proceed to the consideration of the graver cases.

In the *simple* form of scarlet fever, where there is merely some vascular excitement, disturbance of the digestive functions, the eruption of the skin and redness of the mucous membrane, without swelling of the throat, nothing more is needed than a mild laxative, followed by a gentle refrigerant and diaphoretic treatment, with the avoidance of fatigue and exposure and the adoption of a careful diet, not only during the four days of febrile action, but until the desquamation is complete. A dose of good calcined magnesia, adapted to the age and other peculiarities of the patient, should be given on the first day of the disease. Lemonade, if the taste of the patient desire it, may be used freely as a drink, and it may be prepared either with simple boiling water, or with barley or rice water; and in either case may be rendered more grateful by the addition of ice. In the case of infants and young children, ice water or gum water is more acceptable than either. As a diaphoretic, the common neutral mixture, prepared with the natural lemon-juice and carbonate of potash, and not with the citric acid of the chemist, is very useful. The addition to this mixture of a small quantity of the spirit of nitrous ether is of service, as it not only increases the tendency to moisture of the surface, but also promotes the secretion of urine, which you remember is liable to be diminished towards the close of the disease. This secretion has also been found to be more acid in this disease than in health, and the use of an alkali was therefore suggested. To meet this indication, the carb. of soda has been much employed, and I can assure you that very many cases have passed through my hands to my entire satisfaction, in which no remedy was employed beyond the weak solution of this salt with the addition of sweet spirits of nitre. I am in the habit of directing the solution of a teaspoonful of the soda in a tumblerful of water, to which one teaspoonful of sweet spirits of nitre is added, and give from one teaspoonful to a dessert-spoonful every hour or two, according to the age of the patient. In these milder cases, the appetite is often but little impaired, and it is therefore important to guard against impropriety in indulgence. I am much in the habit of directing for children the cake known in this city as "lady finger" or Naples' biscuit, which contains nothing but wheat flour with a little sugar and egg; or a thin

slice of stale bread toasted quickly; or the biscuit known as "dried rusk," with milk diluted with boiling water sweetened, for the morning and evening meal. Where the fever is very slight, milk-toast without butter may be permitted. It is better that the midday meal should be of the same character if it can be accomplished; and no animal matter, either solid or in the shape of broth or soup, should, on any account, be allowed during the first four days. Where grapes and oranges are accessible, they may be freely used; care being taken that the skins and pulp are not swallowed; and you will find the indulgence of the child in these harmless articles will much abate the desire for other food.

Where the case is more severe and the nervous system more deeply implicated, and we have to contend with muscular twitching, or trembling, or delirium, you will derive the greatest possible benefit from cutaneous ablutions, to be employed conjointly with the treatment first indicated. No slight diversity of opinion with respect to this practice has been expressed by medical writers and practitioners. Under the erroneous impression that some morbid matter was present in the fluids which was to be eliminated by the skin, some have objected to the application of water to the surface, on the ground of its tendency to resist this action; whilst others have feared to resort to it lest it should diminish the cutaneous activity, and produce a transfer of the disease to the nervous centres. Both these views are founded on false notions of the pathology of the disease, and experience has fully proved the apprehensions they suggest are without foundation. Equally great has been the difference of opinion as to the mode of application of water. You must in this, as in all other cases, adapt your application to the object you have in view, and the circumstances of the individual case. In the large majority of instances, the object to be attained is merely the abstraction of heat from the surface, and the consequent diminution of nervous excitement. This may be obtained with the greatest comfort to the patient and least inconvenience to the attendants, by simple sponging with water. It will allay the heat, sooth the tormenting itching of the surface, and reduce the frequency of the pulse. The temperature of the fluid should be adapted to the sensations of the patient. There are

great constitutional peculiarities as regards the influence of temperature on the surface. While some persons in health enjoy a high temperature, and find all their functions performed with most comfort during the warm season, others are then languid and oppressed, and long for the return of the cold weather. In the use of baths, a like diversity is found. The languor and depression which in one person will follow the resort to cold bathing, will in another result in equal degree from the employment of the warm bath. Now these same constitutional peculiarities are carried into the hours of sickness. Tepid sponging may always be employed with benefit where the skin is hot and dry, the pulse quick and strong, and the patient restless. Affusion of water at a temperature not less than 96° or 98° of Fahrenheit, will in most similar cases be very beneficial, and this especially in those patients where there is great restlessness and delirium. It allays nervous irritability, and is often followed by refreshing sleep. Currie, of Liverpool, has advocated the use of *cold* affusions in this disease in very strong terms, and he has been followed in this recommendation by other writers. The preponderance of testimony is, however, against it, and it appears to me to be founded on imperfect views of the operation of cold. We are all familiar with the fact, that its primary impression is sedative. This cannot, however, be long maintained without producing serious depression of the vital force. When it is interrupted before this exhaustion is brought about, the result is increased action of the general circulation, and also of the capillaries of the part to which it has been applied. Both these conditions are injurious in scarlet fever : and at the best the cases reported by Dr. Currie prove only that no mischief resulted, since the most he claims is the final abatement of the fever on the fourth day. The remarks of Dr. Chapman on this subject are characterized by that sound discretion, for which he is so remarkable. Especially adapted, in his opinion, to those cases in which the nervous system is most deeply involved, he asserts that he has derived from the application of cold water to the surface, more positive benefit, than from any other remedial measure he has employed. There is one set of cases to which it is peculiarly appropriate; I allude to those in which there is violent delirium, with great heat of skin, very rapid pulse, and extreme restlessness, and not unfrequently con-

vulsions, or at the least violent muscular twitching. Bleeding, whether local or general, is in such cases almost always followed by fatal results. But a cold douche to the head, maintaining the impression by cloths wrung out of iced water, while the whole surface is freely sponged with that fluid at the temperature of the chamber, or but little below it, will do more to procure tranquillity and reduce the nervous excitement, than any other plan that can be adopted. Much important testimony to the value of this treatment, variously modified, might be adduced. By Dr. J. Forsyth Meigs the employment of affusion of water at 96°, containing a small quantity of vinegar, is mentioned with approbation. I have long resorted to baths from 96 to 100°, to which whiskey has been added as a means of tranquillizing young children, and inducing sleep. You will bear in mind that the temperature of the surface in this disease is much exalted above the natural standard of health. When then you resort to the application of water which feels warm to the hand of the person who uses it, it is yet so far below the temperature of the patient that it abstracts heat from the surface, and hence it is that apparently tepid sponging is followed by nearly the same results as those ascribed to more positive cold, and the shock being less it is not so liable to be followed by pernicious reaction. It diminishes the capillary excitement, and maintains a more healthy condition of the cutaneous functions; the interruption to which exerts so baneful an influence on the subsequent course of the disease. The influence of these results on the disease appear sufficiently great to account for the benefit conferred, without adopting the suggestion of Dr. Chapman, that "while mitigating undue excitement by its sedative agency, it also proves more directly the corrective of the effects of the specific virus causing the disease;" to which I draw your attention only for the purpose of exhibiting how high is the estimate he places on this mode of treatment. Dr. Condie is equally decided in the expression of his confidence in it; and Dr. Bell, in his work on baths, asserts "there is no other remedy which unites to any thing like the same extent, efficacy with safety, and immediate pleasurable results, as the cold bath."

If you bear in mind the importance of the functions of the skin, and the great influence the interruption of them must have

upon the condition of the circulating fluids, and the nervous centres, you will not think undue prominence is given to this remedial agency. More recently, similar views have led to the adoption of a practice, which, though highly lauded by some of my professional friends who have employed it, when first presented to the mind has no very strong claims to regard. I allude to the employment of inunctions, originally suggested by a German author in the offensive shape of rubbing with the skin of fat bacon. It is rendered less disgusting when modified, as by a recent English writer, who commends it as equally applicable to all febrile diseases, and resorts to an ointment composed of equal parts of suet and lard, which is to be rubbed into the dry skin by vigorous friction. Whatever benefit may accrue from this practice, it can be ascribed only to the soothing influence of the unctuous application to the skin, which acts here as in erysipelas, in which it certainly allays the local irritation, and thus by the removal of one important cause of excitement, may tend to the subduing of the febrile action. How far it may be applicable to the latter stages of the disease, and to those cases in which the sedative influence of cold would be pernicious, I am not prepared to express an opinion; though analogy affords many examples, which might, perhaps, induce some to think favorably of the practice as modified by Mr. Taylor, and to give it a trial, not only in scarlet fever, but in other febrile diseases, with a dry, husky condition of the skin. Nothing can be conceived less likely to promote the restoration of a patient than the German practice as reported in Ranking's Abstract. Not only is the material used for anointing the skin offensive in itself, but directions are given that the clothing should not be changed, "as a clean shirt takes up more of the fatty matter than one already saturated. The rubbing in is to be kept up twice a day for *three weeks*, and once a day *during the fourth*. The patient is, *after this*, to be washed daily with soap and cool water, and then only is the warm hip bath to be commenced." It would require the utmost confidence of success, to reconcile an American mother to such treatment, or induce an American physician to make his daily visits to a chamber so foul. Whatever benefit might accrue from the softening of the cuticle, would be more than balanced by the loathsome effluvia. Nor does the length of time during which the

application is to be made, convey an impression at all favorable to the remedial influence of this mode of treatment.

You will thus observe, that in the treatment of the simple form of scarlet fever, I am inclined to adopt a very simple treatment, even in those cases in which some symptoms of a very formidable character present themselves. Emetics recommended by some, may be harmless if employed in the very onset of the disease, when the spontaneous vomiting by which it is often ushered in, would appear to afford a natural indication for their use. If the stomach is known to be loaded with some improper food, or if the effort at vomiting is unsuccessful, a small dose of ipecacuanha may be given to aid in the expulsion of the contents of the stomach. I have never found it necessary to resort to them except in those cases which are ushered in by convulsions as the primary symptom, and which in their onset cannot be known to be scarlet fever, unless some direct communication with the disease, or its presence in the family, should give occasion for suspicion. In either case, the object to be accomplished by the emetic is very simple.

You may remember that when treating of the cause of the disease, I referred to the fact that it is often developed by some agency independent of the specific influence which gives to it its essential character. Whatever disturbs the healthy balance of the system, may thus prove the origin of a case; and among children nothing more frequently acts thus, than impropriety in diet, whether in quantity or quality. Digestion is suspended for the time, either from having been taxed beyond its normal power, or from the depressing influence of the scarlet fever miasm. In either case the presence of the *ingestæ* in the stomach becomes a source of irritation, which greatly aggravates the danger of the patient. The more promptly this offending matter can be discharged the better; and a dose of ipecacuanha, proportioned to the age of the patient, should be given the moment the power of deglutition is restored. Such cases generally occur in childhood or infancy. The body should be immersed in warm water, while a cold cloth is applied to the head, or cold water poured upon it from a slight elevation. This will almost always suspend the spasmodic action sufficiently long to permit the swallowing of the ipecac. which acts as a simple evacuant.

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Purging, beyond the mere evacuation of the bowels as suggested, by magnesia, is positively injurious, and the use of calomel in this disease is, I think so deleterious, that if I were in doubt as regards a case, whether it were scarlet fever or no, I should think the doubt sufficient cause for withholding the use of that remedy, so great is the depressing influence it exerts in its primary impression. There is, in fact, no indication to be met by the use of purgatives; certainly none demanding the resort to mercurials. Neither the symptoms present, nor the results of examination of the bodies of the dead, afford any reason to suspect the presence of those disorders of the viscera, either functional or organic, to the relief of which this remedy is so well adapted. The depressing influence of calomel, and the irritation of the mucous membrane by the other cathartic remedies are both injurious. Bleeding is better endured in the simple form of the disease than in any other. But when the case is not violent it is unnecessary, and if it assumes a deeper grade of severity, my personal experience is very decidedly unfavorable to its employment. I have never seen any good result from it, even in those cases in which the nervous symptoms were most severe, and the vascular excitement the most intense, and I have, alas too frequently! had occasion to mourn over its fatal influence. The impression of cold will, in these cases, be always sufficiently sedative to allay the nervous excitement; and neither analogy nor direct examination of the results on the bodies of those who die, affords any reason to suspect the existence of cerebral inflammation in them. In almost every instance in which I have resorted to depletion, either local or general, in cases of scarlet fever in the primary stages of the disease, no matter how vigorous the patient, or violent the symptoms, the case has had a fatal termination; and in no cases has its evil influence been more manifest than in those in which convulsions or violent delirium, accompanied by sudden shrieks and grinding of the teeth, as in meningitis, would appear to have presented the strongest possible reason for a resort to it. You will find I place an entirely different estimate on the value of depletion in the treatment of the sequelæ of this disease.

Permit me to describe to you one case which occurred in what might be properly termed the transition stage of my views of the

treatment of this disease. It will illustrate, at the same time, the character of a severe attack of *simple* scarlet fever. The subject was a healthy boy, five years old. He had retired to bed in his usual health. About daylight I was called to see him with convulsions. I found him wholly insensible, with violent spasmodic action of the whole body and all the extremities, pupils contracted, pulse frequent, and skin hot. Though it was impossible to arouse his attention, yet the least disturbance, as in moving him, or administering an enema, produced increased convulsions followed by long continued muscular tremor. On enquiring into the history of the attack, I was informed he had been waked up by sick stomach, and the convulsions had occurred whilst he was in the act of vomiting. Portions of an apple eaten on the previous day were ejected just as he had swallowed it, imperfectly masticated. Supposing the case to be one entirely dependent on indigestion, so frequent among young children, I adopted the treatment appropriate to its relief. A stimulating injection was promptly administered, and the child removed to a warm bath; and so soon as it could be procured, a dose of calomel and ipecacuanha was given during an interval between the convulsions, while mustard cataplasms were applied to the extremities and epigastrium for the purpose of revulsion. At the end of two hours he vomited again, throwing off an additional quantity of undigested apple; soon after which he recovered his consciousness, so far only as to protrude his tongue when solicited to do so. He neither spoke nor manifested consciousness in any other manner. He continued through the day to start much, and manifested no knowledge of the action of the bowels produced by a dose of magnesia given soon after the operation of the emetic. As the convulsions did not return, and the pupils recovered their natural condition, I determined to rely on the counter-irritation of a blister, which was applied to the nape of the neck, and cool cloths kept constantly on the forehead, and to wait for the full effect of the purgative. The pulse continued very rapid throughout the day. The following morning I found him with a vivid eruption on the face and neck, conjunctiva injected, eyes upturned, and pupils contracted, pulse very rapid. The tendons of the wrist twitched incessantly under the finger; he started frequently as though about to spring off the bed, and grated his teeth with much violence.

It was impossible to arouse him; and his pulse was still as frequent as on the previous day. There could be no hesitation in recognizing scarlet fever, even if the tongue had not assumed the peculiar appearance which is so common in that disease. There was, however, no evidence of angina, except some little shrinking on passing the finger beneath the angle of the jaw. The cerebral symptoms were certainly urgent, and appeared to demand the most energetic treatment. In any other disease than scarlet fever, I should not have hesitated to resort to free depletion. Sad experience in several cases, which had then recently passed through my hands to a fatal termination, in which the convulsions and delirium had been even more violent, had led me to determine never again to employ depletion in such cases. I explained to the father my views of the case, told him the result of my observation, assured him of my readiness to meet any other physician of experience and good judgment in consultation on the case, or even, if he desired it, to yield the treatment to another; that if I employed any depletion, it must be to the smallest possible extent. Twelve leeches were applied to the temples, by which but about one ounce and a half of blood was abstracted—and the case was then committed to a mere expectant treatment. The rash was fully developed. There was no affection of the throat, beyond that which was indicated by the tenderness on pressure. The coma gradually subsided from hour to hour, till, on the fifth day, the symptoms all disappeared, and convalescence was fairly established. The favorable result of this case afforded me much encouragement. While in every instance in which active depletion had been employed by me for the relief of the cerebral symptoms, death had ensued; here was a propitious result, though the amount of blood drawn was too small to be entitled to any part of the credit of the case. I was thus confirmed in the opinion, that the cerebral symptoms were purely nervous, and had no connection with inflammation, or even vascular congestion. That the proper indication was only to allay nervous irritation, and to avoid every agent which should prostrate the vital energies. I accordingly from that time adopted a treatment having this object in view, in all similar cases, and have no hesitation in expressing myself entirely satisfied with the result.

I should now not employ even the calomel which was added to

the ipecacuanha in this case, under the impression that it was wholly dependant on gastric disturbance,—but should rely on the simple evacuants, to get rid of the ingestæ; following them by the tepid bath or affusion, and the use of simple drinks, with entire rest. You will observe that the *whole train* of morbid phenomena disappeared as the case approached the period at which scarlet fever terminates. I saw it first before daylight on the morning of Tuesday, and on Saturday convalescence was fairly established. To sum up the treatment of simple scarlet fever, I should adopt and recommend that of Dr. Armstrong: “Open the bowels (*not purge*) every day with some mild aperient,” (if spontaneously opened, there is no need of medicine.) “Keep the patient at rest, between cool clean sheets, on a bed or on a mattress with light clothing, and in a temperature from 56° to 60° F. Sponge the surface with tepid water twice or three times a day, while it is hotter than natural. Admit plenty of fresh air, allow a bland diet, and in two or three days the patient will be well.” Above all, do not allow the dread of the name scarlet fever to induce you to adopt a treatment which shall be more injurious than the disease.

LECTURE VII.

While the general character of the *simple* form of Scarlet Fever is sthenic, and, as I have remarked when describing the treatment appropriate to it, will bear depletion better than the other varieties, though never demanding it, the *anginose form* is not so uniform in this respect. In different epidemics it presents every grade of action, from one of acute inflammatory fever, till it is merged, by imperceptible shades, into the low or malignant form. Hence arises the great variety in the modes of treatment recommended by different authors, all equally entitled to your confidence; and the great difference in the mortality in different years, or in the same year at different places. This difference in mortality cannot always be ascribed to different modes of treatment, though this does undoubtedly exert a powerful influence. In the London Fever Hospital it varied, in the course of eleven consecutive years, from *one* fatal case in every

six, to *one* in *forty*; and an equally curious variation will mark the practice of most medical men, not only in the course of years, but even during the same year, in different parts of the same town, or district of country, and in different families. The observation of these facts has caused me to be very cautious in the expression of condemnation of any particular mode of practice. The candid remark of the judicious and upright Dr. Fothergill may be borne in mind with great advantage: "In some cases the disease appears to be of so mild a nature, and so benign, as to require but little assistance from art; persons even recover from it under the disadvantages of unskilful and injurious management; whilst in others the progress of the symptoms is so rapid, and the tendency to corruption so strong, that nothing seems able to oppose it." It is not, therefore, just, always to estimate the advantage of a plan of treatment by the recovery of a limited number of patients. It may merely indicate that the power of nature for self-preservation is sufficiently strong to resist the combined injurious influences of the disease and the treatment. I desire to make this remark with entire candor, and that it should be applied with equal fairness to the treatment I myself suggest, as to that equally strongly recommended by others; while, at the same time, I would assure you that it is not without personal experience of the effect of other plans, that I have adopted my own.

This same general remark as to the limited duration of the original disease, the importance of which I endeavored to impress upon you when the simple form was under consideration, is equally applicable to this. It is of far greater importance, however, to keep it ever in your mind, and to allow it to modify your practice. The greater urgency of the symptoms appears to demand a proportionate increase of the energy of treatment. The local lesions are frequently so severe from the very onset, as to require anxious care; and the influence they exert in prolonging the fever, by their irritation after the primary disease has subsided, is well calculated to render the treatment obscure, and the result doubtful. Few minds are so well balanced as to be able to resist the influence of these circumstances, or capable of such nice discrimination as will enable them to arrange the symptoms and adopt the treatment without improper bias. Not

only does the severity of the local lesions, in many cases, incite to the adoption of a treatment needlessly active, but the fear of the result of these local inflammations is often so great, as to overwhelm the judgment. I have known not a few lives sacrificed to the anxiety to avert anticipated evils, and to cure a condition which art can only *relieve*, while nature herself is working the cure, in the regular course of events. Nor have I any wish to screen myself from the censure of being a participant in such results. The remembrance of too many cases in which I have had reason to regret a too energetic treatment, whether depletory or stimulating, urges me thus to press upon your attention, opinions which have been formed at the expense of much personal observation.

The occurrence of a local lesion giving rise to the *anginose* variety of Scarlet Fever, does not of itself involve any change in the general principles of treatment already laid before you. In its slightest degree the *anginose* manifests itself by a slight tenderness about the angle of the jaw, with some enlargement of the lymphatic glands. If the condition of the fauces is examined, the membrane lining the arches and covering the tonsils and uvula, will be found more intensely red, and sometimes slightly cedematous. From this condition the severity of the local affection gradually increases, till it assumes the various appearances formerly described.

The only change in the treatment demanded by this local affection, when there is no tendency to sloughing of the inflamed organs, nor general disposition to prostration of the vital force, is attention to those agents which will afford present relief from the discomfort it occasions. The external swelling and tenderness will yield to the soothing influence of warmth and moisture. When properly applied, this is always grateful, but when done in a slovenly or careless manner, is exceedingly offensive. A flannel cloth wrung out of hot water, and applied with moderate firmness, and of several folds thickness, and then covered with a layer of oiled silk, and that enveloped in a nice napkin, will retain the necessary degree of warmth and moisture a long time. It is lighter than the poultices commonly resorted to, and is free from the smell which renders them offensive, and does not leave the dried deposit which forms around the edges of the cataplasms.

Next to this in adaptation is a thin layer of Indian mush, thoroughly boiled till it forms an adhesive mass, and applied in a thin flannel envelope, taking the same precautions to avoid evaporation. You may think these are matters which may be left to the attention of the nurse; but you will find that not only your own reputation will be increased, by your ability to give minute directions about apparently trifling matters; but, what is of vastly greater consequence, the present comfort of your patients will be increased, and these little things influence, in a great degree, the ultimate result. To no portion of human experience is the line of the satirist more applicable, than to that which comes under the notice of the medical adviser :

“ Let school bred pride dissemble all it can,
These *little things* are *great* to little man.”

Great not only in relation to comfort, but to results.

But while warmth and moisture externally applied are thus important, the internal condition requires an opposite treatment. There is nothing so effectually soothes the internal irritation, and averts the probable results of the excited action of the capillaries of the mucous membrane, as the free use of *ice*. In the same manner as the sponging or ablution of the surface, it acts not only in the relief of the local inflammation but also on the general nervous system. The natural instinct of the patient calls for such treatment, and its appropriateness will commend it to every one ready to throw off the trammels of authority. I had long employed it to great advantage before I was aware that it had been used by any other person, but am happy to be able to fortify my testimony to its usefulness, by the report of Dr. S. Jackson, of Northumberland, which is given in the North American Medical and Surgical Journal. Dr. Jackson deserves, I believe, the credit of first drawing the attention of the profession to its use, through the agency of the press. I direct the ice to be divided into *small* fragments, such as can be easily held in the mouth without dissolving. When thus prepared, if wrapped well in flannel and placed in a bowl at the bedside, so as to be easily accessible, the patient may use it as freely as agreeable. When old enough to perform the act of gargling, iced water is the best article for that purpose. In a large majority of cases I have found this local treatment, joined

to the same general course previously recommended, lead to the entire subsidence of the local symptoms simultaneously with the decline of the primary fever.

Would that I could promise so happy a result in every case, even where the primary symptoms are least threatening. It occasionally happens that ulceration of some part of the mucous membrane occurs, either in the posterior nares or the fauces, and gives rise to a profuse secretion of viscid mucus, or a discharge of an acrid fluid, which spreads the destruction over adjacent parts, and, as I have mentioned already, even excoriates the skin when it is allowed to rest upon it. It is almost equally important to relieve both of these conditions. The latter, by spreading the ulcerative process, adds to and prolongs the irritative fever, while the former very materially increases the risk of a fatal termination by the serious impediment to free respiration which it interposes. The vital powers already prostrated by the depressing agency of the miasm which produces the disease, the blood poisoned by its deleterious influence, the life or death of the patient may depend on the freedom with which air is drawn into the lungs. The nervous force diminished and the muscular power abated, we have only to obstruct the air passages through which the life-giving oxygen is admitted, to cut off the only avenue for hope. How often have I seen a poor child lie with the nostrils—the natural breathing channel—entirely obstructed, the mouth unnaturally open to supply a supplementary avenue for air, yet tossing and struggling in instinctive efforts for fresh air to vivify the blood; while the injected conjunctiva, the upturned eye, and the livid hue, all told how vain was the effort. Though when it has reached this point in the downward course, little hope can cheer our efforts, even then they should not be abandoned, as relief to suffering is within our reach, even though death may finally conquer. Gargling is wholly useless; the seat of the diseased action is beyond its reach, and the barbarous substitute of swabbing is but little more effective, with all the pain it gives to the patient and trouble to the operator. The *syringe* affords a most effectual and very easily applied remedy. When no other was accessible, I have employed a common gill pewter pipe; but the neat glass syringe now used for cleansing the ear is admirably adapted for this ser-

vice. Water alone is not sufficient to inject. A little nice soap, which has no volatile oil in it, may be diffused in the water, in those cases where the irritation of the mucous membrane gives rise to a viscid tenacious secretion; or if this is not effectual in changing the action, a very *weak* solution of sulphate of copper or zinc. Either of these agents coagulates the mucus and facilitates its removal at the same time that it acts kindly on the diseased membrane. In those cases in which the secretion is thin and acrid, I have found simple lime water the best detergent. They should be thrown into the nostril, care being taken to have the head elevated at the time and the person of the child inclined forward, while the direction given to the syringe should be such as will cause the fluid to pass toward the posterior nares, and not toward the cells and sinuses. When the throat is much swollen, the fluid thrown into one nostril will often return through the other, thus effectually cleansing both; in other cases it will be rejected through the mouth. The greatest trouble it causes is some little retching or sneezing, either of which is advantageous to the patient. I have often saved life by this simple resort, and commend it to your notice as of great practical value. The solution of sulphate of copper or zinc should not be employed during the first five days of the disease. They then only increase the irritation and aggravate the suffering of the patient, as well as promote the ulceration they are so adapted to cure in the later stage.

The diet of the patient in anginose scarlet fever should also claim the attention of the physician. During the earlier stage, the remarks made on the simple form are equally applicable here. Water ices, iced cream or chocolate ice, subacid fruits and whey, either frozen or dissolved, are excellent, if used with moderation. As the primary fever subsides, animal broths, and bread and milk are well adapted; still keeping in view the fact that quantity is quite as important as quality. Purging as a curative agent is needless, though it is important to secure a regular action of the bowels, which may be readily effected either by small quantities of calcined magnesia or the use of the neutral mixture. We meet with some cases in which there is a tendency to diarrhoea, caused by the irritation of the acid secretions swallowed by the child. These are most effectually

treated by the magnesia in very small doses, which absorbs the acid and carries off the cause of irritation. It should be followed by suitable doses of Dover's powder or laudanum.

But whilst I thus recommend, as the result of my own observations, in a field by no means limited, a treatment so simple, and by some thought inert, when brought into contest with a disease of so formidable character, I am bound to inform you that there are not wanting many authors, and those, too, of the very highest authority in medical science, who urge a very different plan. General bleeding is not without its advocates, as well among our own medical authors as those of Europe. Even those writers who most recommend its employment, do not hesitate to admit that there are epidemics to which it is inappropriate. Cerebral complications have been thought especially to demand it; on that point I have already delivered my opinion. I have never known a patient to recover from this form of scarlet fever when I employed the lancet. The rapidity of the circulation, the heat of the surface, and the buffy coat on the blood, which have been adduced as indications for bleeding or justification of its use, have all been proved by more accurate observation to be susceptible of a different construction. I do not mean to assert that it is not possible for the disease to assume a character which may demand such treatment. I know it to be capable of changes so extreme, that I can easily believe such may have been its character without my having met with the cases. But even many of those authors who coincide with me in the abandonment of general bleeding, still urge the necessity of the topical abstraction of blood by cups or leeches. This practice is, I think, open to still greater reprehension than the other. Not only is it subject to the same objection on account of its depressing influence, but there is superadded the liability to ulceration of the bites of the leeches or the gashes of the scarificator, which give rise to tedious sores, and often leave unsightly scars, even if the vigor of the patient be sufficient to carry him through the combined injurious influences of the disease and the treatment. But while modern observation has cast a shade of doubt on the necessity for bloodletting in even the pure phlegmasiæ, it has brought still greater discredit on the resort to it in the mixed cases of local inflammation with specific fever. Even quinsy,

which is more closely allied to anginose scarlet fever than any other disease, is rarely, if ever, arrested in its progress by either general or topical bloodletting. While, therefore, there is much to discountenance the resort to these measures, there is, on the other hand, little to invite to their use.

The employment of emetics has been highly commended by many authors, and their use may be vindicated more easily than that of bleeding. The shock given to the nervous system is by some thought to promote the development of the disease. This is at least a questionable assertion. I believe the only mode in which they can act advantageously, is by the discharge of the contents of the stomach, which might, if retained, become sources of irritation, and by the production of that determination to the surface which accompanies the act of vomiting. Antimonial emetics are wholly unsuited. Ipecacuanha is the best article that can be employed; and next to it I should rank the powdered alum, so highly and justly recommended by Dr. Meigs in croup. Purging, beyond the mere evacuation of the bowels, is not only uncalled for, but pernicious. It cannot remove the specific irritation of the mucous membrane of the alimentary canal, and adds another to that already existing. Even Dr. Hamilton, while he lauds highly the advantages of a free purge in the beginning, admits that it is not required subsequently. The recovery of patients after vomiting or purging, cannot be adduced as evidence of the benefit of the practice, for reasons already assigned; and when there are any signs of irritation of the mucous membrane, they are decidedly injurious. Dr. Fothergill, speaking of the treatment of the disease, says: "Bleeding was prejudicial," but with that caution which gives the more weight to his authority, adds, "in general; some admit of it at the first attack, but later it never fails to aggravate the symptoms, and in some cases it appears to have produced fatal consequences. Nor has purging," he continues, "been observed to be more beneficial, and nitrous cooling medicines produce the like effect." Gentle emetics, if administered early, he commends highly, declaring that they often cure the disease, even when the symptoms are most threatening.

It not unfrequently happens that at the close of the first week of the disease, as the primary fever subsides, the pulse loses its

frequency, the skin becomes cool and moist, and the patient languid, with loss of appetite. A very moderate use of quinine in such circumstances is useful. Great care is requisite not to push it too far, either in quantity or the length of time. A few days bring you to the period which is especially liable to inflammatory sequelæ. A return of the frequency of the pulse, and an increase of the languor, will mark the occurrence of this condition, and should cause an immediate suspension of the tonic treatment, and great care about the diet. This is especially necessary, as it is impossible to foresee in which of the organs liable to the secondary affections the mischief may develop itself; and the attacks are so formidable, that it is important to guard against the very beginning of the evil. A cerebral or cardiac inflammation would be materially aggravated by the influence of the quinia. The condition of the urine is also an important means of determining how far it may be proper to pursue the tonic treatment. While that secretion continues abundant and clear, and the skin cool and perspirable, there can be no risk. The interruption of the secretion from either of these eliminating organs, or the deep color or turbidity of the urine, would at once indicate the propriety of suspending the quinine.

It is in these cases that we frequently meet with that very formidable complication, inflammation of the larynx, producing all the symptoms of croup. Even in these cases no benefit will result from depletion, or any other depressing agent; dependent on the extension of the specific inflammation from the fauces, it must be relieved by local treatment alone. Emetics of alum or ipecacuanha are the most valuable of our remedies, and may be repeated as often as the urgency of the symptoms requires; care being taken at the same time to afford proper support, by suitable nourishment and stimulants. One of the happiest results I ever achieved, was in the recovery of a child of about two years of age, in whose case the disease was ushered in by convulsions, which yielded to tepid baths, with cold affusions to the head. The disease then ran its regular course, accompanied with much sloughing of the fauces and uvula, and leaving an exceedingly red ulcer. This I treated with the injections recom-

mended above, and was flattering myself with the expectation of a speedy recovery, when the harsh clangor of a croupy cough sounded like the knell of hope. I procured at once a stick of nitrate of silver, fastened in a quill, and, depressing the tongue, thrust it deep into the fauces, with the design of extending the application to the very verge of the glottis itself. A sudden struggle of the child broke off the caustic from the quill, and, to my indescribable horror, one gulp carried into the stomach of the child about two drachms of the caustic. To fail in one's efforts to cure is disheartening enough,—to feel that those efforts, however well meant, have rendered certain the triumph of death, is like being dragged at the chariot wheel to swell the triumph. Determined not to yield without an effort, and saying nothing of the accident, I called for the salt cellar, which was promptly handed me, and compelled the child to take large and repeated draughts of a strong infusion of the chloride of sodium. This of course produced free emesis, at the same time that it rendered insoluble and inert the poisonous mass thus undesignedly passed into the stomach. Whether the result may be ascribed to the action of the caustic, or that of the saline application to the local disease, or, what is more probable, to the oft repeated vomiting, I am not prepared positively to assert. I am disposed to divide the honor between the two latter influences, providentially, though unintentionally applied. Certain it is that most unexpectedly the child recovered.

But the most judiciously planned treatment, though faithfully carried out, will not ensure a successful result, even in those cases which do not manifest any very unfavorable symptoms at the beginning. The impeded deglutition, the labored respiration, the swollen lymphatics, occurring about the end of the first week, or even sooner, all speak of a condition full of danger, while a hard, quick pulse, which generally accompanies this condition, would appear to demand local depletion for the relief of the local disease. You must not allow yourselves to be beguiled even now by this simulation of inflammatory action. The corded pulse tells of irritative action, but not of one which can be removed by depletion, either local or general. Neither would the resort to blisters be a whit more beneficial. Dependent on

the disease of the mucous membrane, it will only yield as that subsides. Happy indeed were it for the patient if it were certain then to disappear. Too often the inflammation results not only in effusion into the cellular tissue, but also in suppuration, either in that tissue or in some of the glands, leaving one of the results of which we shall speak when we come to treat of the sequelæ. This acute glandular enlargement and effusion will yield more kindly to the continuation of poultices and injections than to any other plan. Iodine and the iodide of potassium have been employed both locally and internally, but I believe without any well attested advantage.

The treatment of those cases in which the eruption appears imperfectly developed from the first, or when, after having been well marked, it recedes, or where the force of the attack falls upon the throat, causing great tumefaction and difficulty of deglutition, must be very energetic. In all these cases, this condition evidently results from the overwhelming influence of the poison upon the nervous system. Whether convulsions, or restlessness, or stupor, complicate the case, or mere languor and exhaustion, all are but varying phases of one condition, and that, a condition which is to be removed by appropriate stimulation; and it is in these cases that the capsicum is productive of the happiest results. It was, I confess to you, with great reluctance, I was first prevailed on to resort to a remedy apparently so little appropriate to the treatment of a disease in which the rapid circulation and heated surface seemed rather to call for remedies which should produce a refrigerant impression; and to force a harsh irritating liquid into a throat already inflamed, was, I thought, little short of a refinement of cruelty. The entire failure of the cooling treatment in such cases, led me to test the opposite course, and I can recommend it with entire confidence. Weak animal broths freely charged with capsicum, may be given with great safety, even to the youngest infants; and though it may not—indeed it rarely does—so far rouse the energies of the system as to cause the full development of the eruptive features of the disease, it will so far excite the vital forces as to carry the patient safely through the regular period. Should there be much local disease, it will derive great benefit

from the passage of the broth over it. I have often administered this simple infusion when the stomach rejected the broth, or when I desired to maintain a more constant local impression. The common formula of a teaspoonful of powdered capsicum, the same quantity of common table salt, a large spoonful of vinegar, and a half-pint of boiling water, is an exceedingly good one. Of this, a teaspoonful may be given every hour or two to a child of five years old and upwards, followed by a small portion of broth, or even wine-whey. Brandy and quinine have not the same beneficial influence in these cases that they exert over those we shall consider hereafter. They oppress the nervous centres instead of relieving the load. Where there is great restlessness I have derived advantage from moderate doses of morphia, given in the aqua acetatis ammoniæ, or from the Dover's powder. Wine-whey having more tendency to promote the determination to the skin, may be given in every case with safety, where the quinine and brandy would be inappropriate. The resort to hot and stimulating baths and irritative frictions, and the revulsive treatment generally, which would naturally suggest itself, has never been followed by any advantage so far as I have had opportunity for observation, and the internal use of carbonate of ammonia has also disappointed my expectation.

Under the plan of treatment thus indicated, I have found the cases in which the eruption was irregular, defective, or even entirely absent, yield quite as large a percentage of recovery as those which are accompanied with the most intense degree of cutaneous inflammation. It is worthy of remark that such cases are less liable to be followed by dropsical infiltration of the cellular tissue, though the convalescence is more tedious and imperfect.

LECTURE VIII.

While, as we have seen, death occasionally defies our best directed efforts, and terminates the course of even *simple* scarlet fever, either as the result of some unexpected local inflammation, or, more often, of one of the sequelæ of the disease; and with greater, though still varying frequency, occurs in all stages of the *anginose* variety—the *malignant* form more often sets at defiance the utmost energy of treatment, even when directed by the most consummate skill. Your memory will not have failed to retain the melancholy picture of its ravages in the earlier period of the settlement of this country, as drawn by Dr. Kearsley; and similar vestiges of its progress have been left in all parts of Europe, as well as in every age, of the diseases of which we possess any history sufficiently accurate to enable us to distinguish them clearly. The very term *malignant*, conveys, even to the unprofessional ear, the idea of great danger, and in the language of medicine is meant to express a great tendency to the prostration of the vital forces. The knowledge of the lethal character of this form of the disease, should, however, lead to no despondency on your part, but rather stimulate you to more determined effort to rescue the patient, and increase the triumph of medical science. There are many other diseases which partake more or less, at different times, of this tendency to prostration. Between them and malignant scarlet fever, there is this, however, very important point of difference, that in this the local lesions are very severe, and often in themselves sufficient to cause death, even though the vital energy were not impaired by the peculiar character of the case.

A theory which taught that in this, as in the kindred forms of fever characterized by the same tendency to rapid decline of vital power, there was a previous stage of excitement of greater or less intensity, upon which the subsequent depression depended, not as a mere sequence, but as the effect upon a cause, was at one time generally received, and exerted a most deleterious influence on the interests of medical science. Discarded now by most authorities from its position in connection with other fevers, it

still exhibits some lingering traces of its influence in a few of even the more modern writers on this disease. Those who adopted this view, recommended in strong terms the prompt resort to an antiphlogistic treatment of the early stage, under the impression of the fallacious hope that by such measures they would diminish the primary reaction, and thus avert the consequent depression; and there are not wanting authors of even a recent date, who still teach this erroneous view; and who strongly recommend the prompt resort to bleeding, vomiting, and purging. When called early to these cases, they do not hesitate to direct an antimonial emetic, followed by an active mercurial purgative, nor do they shrink from a prompt and decided bleeding if these fail. They assert that "this treatment, if adopted at the onset of the symptoms, will generally, not only moderate the fever, but shorten the duration and violence of the disease."

Nor is this view, and the practice founded on it, confined to European physicians. One of the most authoritative of our own writers on the diseases of children, my friend Dr. Condie, has adopted them to their full extent, and claims for his practice a degree of success which justifies the positive terms in which he commends his views. "In a table of two hundred and sixty-eight cases, occurring during different epidemics of considerable extent and severity, and treated on the plan laid down by him, (into which bleeding, calomel in full doses, and castor oil with spirits of turpentine, as purgatives, enter,) two hundred and twenty-three recoveries, and forty-five deaths are enumerated." Dr. C. asserts of the treatment he recommends, that "when judiciously carried into execution, it is calculated to disarm the disease of its 'malignancy' and to prevent the necessity for a resort to powerful cordials, tonics and antiseptics, in the advanced period of the attack, to remove the putrid symptoms when they show themselves." "The bold and indiscriminate use of the lancet," Dr. C. "strongly objects to; but of the good effects a cautious use of blood-letting in the manner and under the circumstances directed, is calculated to produce, he speaks from actual observation." "It is," adds Dr. C., "unquestionably, in a large number of cases, the only 'restorative and tonic' upon which any confidence can be placed." In thus setting before you the testi-

mony of Dr. Condie, I have designed to furnish you with the strongest statements in favor of a well directed antiphlogistic treatment.

I need not repeat what I have already told you when treating of the other forms of this disease, nor inform you again that, believing the primary influence of the cause to be depression, I cannot adopt the view which assigns to its first impression a sthenic character. If bleeding, and antimonials, and purgatives are inappropriate to the simple anginose form, much less are they required in that now under consideration, and Dr. R. Williams, after a careful investigation of the history of the epidemics which have prevailed from 1763 to 1834, asserts, with regard to scarlet fever in general, "that the chances of recovery are diminished by the practice of bleeding, in the ratio of nearly four to one, as compared with the chances supposing the patient not to have been bled."

With this expression, my own observation is coincident, and you will find my views sustained by not a few authorities of deserved repute. Dr. Fothergill, than whom a more accurate, careful observer, or more honest writer, cannot be found, when he sums up his views of the practice and treatment of this disease, of which it is evident he saw the *malignant form*, asserts, "that a cordial, alexipharmic, warm regimen has been found by experience to be of the most use in such cases," and condemns as injurious, "bleeding, purging, and antiphlogistics liberally employed." He says: "In some of the first cases I met with, the quickness of the pulse, the degree of heat, the apparent inflammatory redness of the eyes and face, and pain in the head, sometimes urged me to order bleeding, especially if there were any marks of plethora; but in these cases it did not appear to have any advantageous effects; so that notwithstanding the vehemency of the symptoms above mentioned, it seems proper in general to omit this evacuation."

Dr. Kearsley, speaking of the disease as it appeared in Philadelphia in 1746, says: "The pulse was generally full and quick, yet attended with some remissions and even sinkings, but it most commonly kept up those deceiving strokes which sometimes but very improperly indicate the use of the lancet." "Although most of the symptoms in the beginning of this disease,

as well as the fulness of the pulse, appeared to point out to us the necessity of bleeding, yet, should we have complied with the indication, it would have proved a fatal error." That this opinion was the result of observation is proved by the remark, that "the blood which has been drawn away in these cases has been often observed to have a tenacious glue upon the surface, and yet, nevertheless, it has been found underneath to be broken, loose and divided in its texture, and has also thereon very evident marks of a putrid gore which must and does increase by bleeding." "One bloodletting may make a difference of a change from a texture that, with proper management, would have carried a patient through the sickness with safety, to no texture at all, but a total dissolution of all animal fluids which must in course terminate in death. Of such vast consequence is this one article of bleeding, that it has been my choice to give this caution against it in the strongest terms." Dr. Burrows in an interesting article on this disease, in the library of Practical Medicine, remarks of the malignant form, that, "it quickly indicates its formidable nature by the sudden depression of the vital powers. If bloodletting from the arm be a remedy of doubtful propriety in the two former varieties, it is here hazardous in the extreme." Dr. Chapman says, "The abstraction of blood appears to be required by the loaded state of the organs, and contraindicated by the depression of the vital energies. My own conviction is, that it should not be hazarded, unless reaction is pretty firmly established, the circulation in some force, and the skin warm, and even then is to be resorted to with extreme circumspection." And with regard to the general applicability of bloodletting as a remedy in any form of Scarlet Fever he says: "it is true that the loss of blood has no direct curative tendency in the disease, it only abating action, without changing or subverting it; and is usually not well borne to any extent. It is not safe to detract it with the same freedom as in more purely phlegmasial affections, or perhaps, to the amount that the existing indications in the case would seem to demand. Collapse, frightful and sometimes even fatal, I have repeatedly seen to result from an abuse of the practice, and it is always hazardous in an advanced stage of the disease."

Dr. J. Forsyth Meigs, in his able work on the diseases of chil-

dren, after producing the testimony of many distinguished writers on this disease to the doubtful tendency of a resort to blood-letting, says: "On the whole, it is clear, I think, that the weight of evidence is against bloodletting to any considerable extent, in grave cases. If used at all, it is only to be used in the earliest period, and even then with great caution. My own opinion, derived from personal experience, is as follows:—I believe that I have seen general depletion useful in several cases of the regular form, in which there was a tendency to the grave form, shown by the presence of excessive reaction, and still more by great jactitation and irritability, alternating with drowsiness and delirium. But in those sudden attacks of the disease, in which it assumes from the very start the terrible symptoms which threaten extreme danger to the patient, in which we find the child within a few hours of the onset, delirious or comatose, or laboring under convulsions, convulsive movements or contractions, in which the eruption is imperfect or scanty, or copious and of a deep livid tint; in which in other words there are either strongly marked ataxic or adynamic symptoms, general bloodletting has never seemed to me at all advantageous, and I have several times feared that it had been injurious. As to leeches, I have never known them to be really useful but in one case, and in that they were used sparingly, and after an interval of two days. In all other cases they appeared to be without any effect."

I might swell largely the list of authors who have either condemned depletion entirely, or expressed their doubt of its fitness to the treatment and proposed its employment with caution; but I have adduced testimony enough to prove to you that observation places depletion among the remedies of doubtful value, to say the least of it, and thus confirms the view, derived from reasoning on the nature of the disease, its origin and course, which I have endeavored to impress upon you.

But though blood-letting, antimonial emetics, and antiphlogistic treatment, are all, for the same reason, excluded from our list of remedies in the malignant as well as the other forms of scarlet fever, a simple emetic of ipecacuanha, or infusion of *Eupatorium perfoliatum*, the thoroughwort or bone-set, of our own meadows, may be given in the commencement of a case, with decided advantage. It evacuates the *primæ viæ*, and produces a strong

determination toward the surface, without leaving any secondary depression of the vital forces, or exhaustion, such as follows the use of antimonials.

The action of this having been accomplished, your attention should at once be given to the support of the vital power, which will be found flagging from the very commencement in many cases, and to the arrest of the local lesions in the fauces and pharynx. The capsicum is here an agent of great value, acting at once to the fulfilment of both indications. We are indebted to the West India practitioners for the introduction of this remedy to our notice in this disease. We have been taught to look upon it as a simple stimulant, without any direct impression on the general system, and that it acts upon this in a secondary manner, through the increased energy it communicates to the stomach. My observation of its effects in these cases of scarlet fever, does not permit me to adopt this as the only mode in which it promotes the recovery of the patient. It must stimulate the exhausted nervous forces, if no farther than to enable the stomach to appropriate properly the nourishment presented to it. While it thus acts advantageously on the general system, the local impression on the throat is equally beneficial. Though the first sensation produced is one of increased heat, this soon passes away, and is followed by a sense of relief from the tension and soreness which aggravate, so materially, the sufferings of the patient.

I have conducted many cases to a favorable conclusion by these remedies alone, giving the capsicum in the manner suggested, when treating of the form of the disease last under notice, and supporting the strength of the patient by animal broth.

Purgatives have been recommended in this as in the other forms of the disease, even by those who condemn other antiphlogistic treatment; especially calomel, either in combination with those articles usually united with it to secure its prompt action, or followed by castor oil and spirits of turpentine. The object proposed by this treatment, is to promote a free secretion from the viscera, and, as is supposed, remove a load which is thought to oppress the vital energy. The reasoning is, I think erroneous, and the practice founded on it pernicious. The congested condition of the vascular system, and the suspension of secretory action, are de-

pendent on the diminution of the vital forces, and not the cause of that depression; and it were as contrary to common reason to bleed a porter struggling to support a load beyond his power, as to resort to any remedy which diminishes vital force in the malignant form of scarlet fever. In no instance have I seen any advantage result from the use of a mercurial in any form or stage of the disease. Mr. Colden and Dr. Kearsley, however, coincide in the assertion that Dr. Douglass of Boston commends its use, in strong terms, in the malignant form, and even urged it to the extent of salivation. I have not been able to procure a copy of the original work of Dr. Douglass. He wrote, however, at a period when the influence of mercury was thought to be almost omnipotent, and when it was employed with but little discrimination or knowledge of its character, in almost all forms of disease.

My mode of treating these cases, may be illustrated by the record of my experience in one family. It was that of a widow who had been compelled to leave her children without protection, while she returned to England to secure a bequest. The oldest was a girl of about fifteen years.—She and two others were seized simultaneously with scarlet fever. I found her lying, insensible, on the bed, the whole surface of a mulberry hue, the pulse too frequent to be counted, perfect stupor and extreme jactitation, the throat swollen so as entirely to prevent deglutition, the fauces covered with ash colored deposit, a foetid ichor distilling from the nostrils, the eyes injected and upturned. The two other cases presented the usual marks of the severe anginose form. I at once secured the services of a judicious nurse, and in order to call out the utmost exertion of her care and effort, I told her, that though severe, the worst case was not hopeless, and that I was so conscious that the best medical advice would be useless without the aid of good nursing, that I was willing she should have all the credit of her recovery if it were accomplished. I furnished her with a syringe, and introduced a stomach tube through the nostrils. Wine whey, beef broth, highly seasoned with capsicum, and quinine, were injected into the stomach at stated intervals, while the solution of sulphate of copper, and compound capsicum infusion were employed as local applications to the throat, by means of a syringe. Convulsions oc-

curred within a few hours; three days she lay in the condition described, the only evidence of consciousness afforded, was in the resistance she opposed to treatment. On the fourth day the jactitation diminished, and there was a manifest abatement of the stupor, and much to my gratification, she recovered without any sequelæ being developed. The other cases were treated in the simple manner described when speaking of the anginose form, and with an equally happy result.

The application of cold to the surface, and the use of ice internally, has been advocated by some authors even in this form of the disease. I need hardly say that the sedative impression of cold, is as much to be avoided as that of any other agent, but where the skin is hot and dry and the eruption is very abundant, great benefit results from the tepid sponging, and the addition of a small quantity of vinegar or whiskey to the water is advantageous. In the first few hours of a case, or when there is still sufficient intelligence remaining to enable the patient to manage the ice, it may be employed for the mitigation of the suffering from the angina. Several authors speak of fatal collapse following the injudicious resort to external cold.

Dr. Meigs furnishes us with a quotation from Dr. Currie, to whom we owe the introduction of this treatment, which proves that he did not consider it appropriate. The cases to which he refers as "purpurata," are those which I include under the head of malignant, and to such, Dr. C. says, "the cold effusion is scarcely applicable, and tepid effusion makes little impression. In my experience, indeed, all remedies have been equally unsuccessful. It outstrips in rapidity, and it equals in fatality the purple confluent small-pox, to which it may be compared." The internal use of ice in these cases is too often forbidden by the stupor and delirium. Where these do not prevent, it may be resorted to with the same advantage as in the common anginose form. Where there is decided ulceration and sloughing of the throat, great benefit may be derived from the injection of chloride of soda. I have never used it myself, having always relied upon the same injections in these cases as in the more severe instances of the anginose variety. The capsicum wash there mentioned, is best suited to this form of the disease. The internal use of a weak solution of the chlo-

ride of soda has been strongly recommended by Dr. Jackson of Northumberland, who reports many cases in his own practice, and that of his friends, which recovered under the use of this remedy and ice. Its antiseptic qualities have caused it to be employed internally in this as well as in other forms of adynamic fever, but, I believe, with little benefit which could be fairly attributed to this remedy alone.

No attempt should be made to separate the sloughs or detach the deposits from the mucous membrane of the throat, either by mechanical means or by harshly stimulating washes. Fatal hemorrhage is sometimes brought about by this rude interference, or the tendency to gangrene aggravated by it.

The local abstraction of blood from the neck in these cases, can not be too strongly condemned. It can no more arrest the progress of the inflammation of the fauces, than it can that of an external part tending to gangrene. The bites of the leeches do not heal, but continue to permit the leakage of a thin bloody serum, till they take on a low grade of inflammation themselves, which results either in sphacelus, or spreading ulcers. The remark is equally applicable to the use of blisters, which almost always, either slough or ulcerate, and have not unfrequently proved the cause of death even after the sufferer had struggled through the disease for the relief of which they were employed.

Carbonate of ammonia has been highly commended by some authors in this form of disease. One insuperable obstacle to its use, is found in the difficulty of deglutition. Even in those forms of low fever which are free from angina, the pungent character of the remedy makes it difficult of administration, and where there is much swelling or ulceration, it would be impossible that it could be swallowed, especially by a child.

Musk, too, and camphor, have their advocates in those cases where the nervous symptoms predominate. I do not believe they possess any special virtues which entitle them to favor, and prefer depending on a few tried and proved friends, to the resort to many other articles of questionable powers. The rational indications are met by those I have recommended, and on them you may safely rely.

In those *irregular* cases which I have described, it is impossible to direct any plan of treatment. There is no specific for

scarlet fever, even in its well developed forms. You will observe, I have endeavored to indicate to you the symptoms, and to deduce from them a treatment based on the known rules which regulate the human economy in health and disease. Where these laws cease to exert a control, the physician must be guided by his own discretion in each case as it presents itself.

Warm, stimulating, spirituous baths, or vapor baths, may be employed to invite the diseased action to the skin, and thus to liberate the central nervous system from the load by which it is oppressed; and where there is much tendency to collapse, warm wine whey or brandy may be given internally.

In those cases where the skin is hot and dry and yet devoid of eruption, and there is great restlessness, I have used the Dover's powder with advantage. Capsicum, too, in some cases of this kind, has appeared to confer benefits which might be supposed almost to entitle it to the character of a specific; and should never be omitted.

It may not be amiss to furnish you with a succinct statement of the plan of treatment, which, with the reasons on which it is founded, I have thus spread before you.

Simple Scarlet Fever without complication, may be confided to cool drinks, cool air and sponging the surface, with light diet. Where the fever is more intense, a weak solution of carbonate of soda, with a small quantity of sweet spirit of nitre, may be given.

During convalescence, and until the skin has resumed its healthy action, the most vigilant care is required to avoid too great license in diet, and exposure to atmospheric changes.

When the case is complicated by the occurrence of delirium, convulsions, or irregular muscular contractions, these symptoms may best be combated by cold to the head, and sponging the surface.

The *anginose* affection is best treated by the free use of ice, and gargles of cold water, internally; and emollient poultices or wet cloths externally; the general treatment being the same as in the simple form, and the caution about diet and exposure equally, or even more important.

The *malignant* form requires that the first symptoms of failure of vital powers should be met by a prompt resort to the use of capsicum, quinine, wine, and nourishment; while the local affec-

tion is to be treated in the same manner, and by the same remedies as in the anginose form. In the very beginning ice may be used; but when the ash colored deposits appear, or sloughing commences, nothing will equal the benefit you will derive from the use of the capsicum infusion, alternated with a solution of sulphate of copper; care being taken in using the latter, to avoid passing so large an amount of it into the stomach, as shall produce vomiting, and thus depress fatally the already exhausted forces.

Free ventilation is of the utmost importance in all the forms of this disease; but in the malignant form its value is beyond estimation. Nor is there any danger from the influence even of cool draughts, so much dreaded by parents and nurses during the progress of the primary fever.

I am fully aware that many condemn the views I have here presented to you, and that it is not uncommon to find the advocates of the antiphlogistic treatment, attributing the mortality of this disease to the stimulating treatment I have thus recommended. Improperly employed it is certainly pernicious. It should never be resorted to except where the feeble pulse, languid circulation, livid or violet color of the eruption, and sloughing throat give unmistakeable evidence of the failure of vital power. The resort to the treatment appropriate to this state from an apprehension of its approach, is, indeed, likely to induce it. It is even more to be deprecated than the opposite extreme. Where bleeding, the application of cold, or the exhausting treatment has reduced the patient, there is still room for hope that reaction may be produced by the resort to the proper remedies. But where the nervous energy has been exhausted by the addition of artificial stimulation to the febrile excitement, a state of prostration from over excitement is induced for which we have no remedy. While, therefore, I desire to caution you against the resort to those measures which directly exhaust the vital power, I would enter an equally strong protest against the premature employment of stimulating remedies. If, as in the case I have described, the malignant symptoms are present from the first, adopt immediately the stimulation necessary to counteract their tendency; but do not let the fear of its future occurrence induce the premature resort to them as a preventive. This, like bleeding beforehand to avoid inflam-

mation, will only precipitate or make more certain the result which is dreaded. These remarks are especially applicable to the use of quinine. The wine whey is transient in its influence, the capsicum gives rise to no febrile reaction, but the quinine produces a more permanent impression upon the nervous system, and has a stronger tendency to excite local inflammation. Properly applied, it is the sheet anchor of our hope; the very power which renders it so, causes it when misused to be most pernicious. It should be given in full doses at long intervals, leaving the stomach free to receive the animal broth, wine whey, or brandy. These latter are most conveniently given in arrow root or some of the usual farinaceous articles of diet.

Before passing to the consideration of the sequelæ of the disease, and the proper treatment of them, some notice must be bestowed on the question, how far it is possible to remove the susceptibility to the impression of scarlet fever. It is now many years since it was announced that the administration of small doses of belladonna to those who were exposed to the influence of this cause, whether epidemic or contagious, produced an almost entire immunity. The source from which the suggestion came, though entirely destitute of authority, was less calculated to excite suspicion than the reasoning by which the assertion of its power was supported.

Its use was first suggested by Hahneman, who supposed that in the affection of the throat, and redness of the face, produced by an *excessive dose* of this narcotic poison, he discovered a train of symptoms similar to those of scarlet fever, and hence inferred that its use in *infinitesimal doses* would produce a condition similar to that caused by the miasm, and prevent the real disease. No reasoning could be less logical. Knowing how many escape when exposed to the influence of this specific poison, much incredulity as to the effect of the remedy has been entertained. Still it has been extensively tried, as well in this country as in Europe, and the testimony to its prophylactic influence cannot be disregarded.

MM. Rilliet and Barthez, gave us the report of Gumpert, who employed it in more than twenty families with entire success. Berndt found that of one hundred and twenty-four children to whom it was administered during exposure, only fourteen

took the disease ; and Hillenkamp had still better results, only five having sickened out of one hundred and twenty who took the belladonna. Our own medical journals contain reports of the same favorable character. Dr. Condie, however, asserts that having tried it in repeated instances, he never found it to produce the slightest effect in mitigating the character or preventing the occurrence of scarlet fever.

There are so many sources of doubt, that it is impossible, in the present stage of our experience, to give a positive opinion. The only field for a crucial experiment is some large institution for orphans or destitute children, where it can be tried, while all other means of prevention are avoided. Larger numbers than can be found in private families, and more careful observation are necessary to settle this point. In the mean time, though the reasoning of Hahneman is fallacious, it is quite possible that the influence on the nerves of organic life, of a slight narcotic, may so preoccupy them that they shall not yield to the impression of the epidemic or contagious principle. If it be proven to have this effect in scarlet fever, it should be equally available in the case of other diseases which are diffused by the same agency. Professor Chapman long since drew attention to the effect of the occupation of the stomach by food, in preserving those who were exposed to miasmatic impressions. It were impossible to keep the stomach always filled with food ; but the nervous system may be kept constantly affected by the narcotic, and, if given in quantities sufficiently minute, without inconvenience. I have never tested the effect myself, not having had an opportunity which was sufficiently guarded from sources of uncertainty. Though I have thus drawn your attention to it on account of the positive assertions of its advocates, and have endeavored to exhibit the manner in which, if at all useful, it operates, I have no faith in the prophylactic power of this, or any other agent. The mode of exhibition recommended, is to suspend *three grains* of the extract of belladonna in *one ounce* of water ; of this, *two or three drops* are to be given twice a day, to a child under twelve months old, adding one drop for each additional year of age.

LECTURE IX.

We now come to the consideration of the treatment of those diseased conditions which are commonly recognized as the *sequelæ* of scarlet fever, though they may perhaps be considered, with greater propriety, a mere continuance of the diseased action caused by the specific poison.

You will remember that I described them as the consequences of the primary disease, and spoke of them as susceptible of division into two classes. Those which appear to be the mere continuation of the local lesions developed during the progress of the disease itself, ulceration of the throat, enlargement of the cervical glands, with infiltration of the cellular tissue of the adjacent parts, abscesses about the neck, and inflammation of the ear, were grouped together as the first class: while the inflammation of the endocardium, or of the kidneys, and the dropsical effusion and rheumatic fever, were arranged as the second, and an attempt was made to exhibit the connection of the dropsical effusion with the interruption of the functions of the emunctories of the skin and kidneys. This division was not adopted without design, and has reference to the treatment appropriate to the several groups.

The ulceration of the throat requires no change in the treatment which has already been suggested as appropriate to the anginose symptoms during the primary stage. The lime water, solution of chloride of soda, sulphate of copper or nitrate of silver, may be injected as detergent and stimulating applications for the cure of the internal affections, should they not subside spontaneously with the decline of the fever: while fomentations are still applied to the external swellings. If suppuration occur, the abscesses should be discharged so soon as the matter approaches near enough to the surface to permit the safe resort to the lancet.

The affections of the ear which complicate scarlet fever in its progress, or are developed as *sequelæ*, should always receive prompt attention, as they not unfrequently result in the entire destruction of the diseased organ. There may be *otitis* or acute inflammation, or mere *otorrhœa*. The least important

cases are those in which the inflammation commences in the meatus auditorius externus. This may occur at any time during the progress of the disease, but most commonly commences about the fourth or fifth day. If the patient be a young child, it will be found more drowsy than usual, and when awake, more fretful; and if old enough to express the seat of distress, it will indicate one or both ears. In some cases, however, there is little or no pain, and the first intimation of any local lesion will be derived from the stain of the cap, or pillow-case, by a glairy, purulent discharge, which excoriates the concha as it flows over it, and occasions a vesicular eruption wherever it touches the skin. Whether the accumulation of this matter in the ear produces an extension of the disease to the tympanum, or the membrana tympani itself takes on the inflammatory action, it not unfrequently happens that even those cases which are attended by little or no suffering in the beginning, become very serious in their progress, and result, finally, in the destruction of the membrana tympani and discharge of the ossicula.

During the first few days, the external meatus should be kept perfectly cleansed by the injection of simple warm water with a little pure castile soap dissolved in it; after which, if the discharge still continue and become foetid, the weak solution of chloride of soda, or sulphate of copper may be employed.

The injection of the ear should never be entrusted to the mother or nurse. Ignorant of the structure of the parts, they are either restrained from the effectual use of the remedy by apprehension of doing mischief, or employ an undue force and injure the inflamed membrane. Where the ulcerative process has destroyed the membrana tympani, especially, great care is requisite not to throw the fluid so far into the cavity that it shall lodge there and become a source of additional irritation.

Even the cases which originate externally, sometimes result in the entire destruction of the ear; but where the inflammation is extended from the fauces through the eustachian tube to the internal ear, the pain at the time of invasion is much more severe, and the consequences are much more serious. In the case of infants or young children, this internal affection is first manifested by sudden shrieks, like those of meningitis, accompanied by grinding of the teeth and violent febrile excitement; these symptoms may con-

tinue many days before any discharge from the external ear affords positive evidence of the site of the inflammation. These are the cases which result, of necessity, in the destruction of the organ, and lay the foundation for necrosis of the petrous portion of the temporal bone, and occasionally give rise to inflammation of the dura mater and death. It is not at all uncommon for the matter to find its way into the mastoid cells, and to give rise to abscesses behind the ear, which discharge externally; and leave openings, through which pus, contaminated by the dead bone, is discharged during a series of years; making the patient an object of disgust and pity by the excessive fetor. I have known both ears thus destroyed, reducing the child to the condition of a mute.

This extension of the inflammation from the fauces to the ear, may occur at any period; either during the progress of the scarlet fever, or after the primary symptoms have declined. In either case, it demands prompt and energetic treatment; and unless the prostration of the vital forces is so extreme as to render the recovery of the patient hopeless, *leeches* should be applied to the mastoid process, followed by a blister. No apprehension of sloughing or ulceration should be allowed to interfere. The introduction of warm olive oil and laudanum into the ear may be resorted to for the temporary relief of the suffering, simultaneously with these applications; and morphia may be applied afterward to the blistered surface, in doses appropriate to the age of the patient.

Croup, when it occurs as a complication during the first week of the disease, should be treated by emetics of alum or sulphate of zinc. Should it be developed during the convalescence, the disease of the larynx will partake of the character of that of the adjacent parts, and if that be one of active inflammation, leeching may be safely resorted to; the quantity of blood drawn being regulated by the degree of reaction which is present. Cases of this kind form the connecting link between the first class of sequelæ and the second; to the consideration of which I shall next invite your attention.

In taking leave of the primary stage of the disease, and the local affections associated with, or immediately dependent upon it, we encounter an entirely new condition of the system, one of active inflammation.

You will remember that the *malignant* form of scarlet fever is less likely to be followed by those sequelæ which I have grouped together as the second class, than the *simple* and *anginose*. Though in the former, the powers of the system may be so far exhausted that it is long in recovering its healthy tone, and the convalescence may be protracted to many weeks, and rendered more tedious by the condition of the throat or ears, there appears to be little or no tendency to the secondary inflammations or dropsical effusions which so frequently follow even the mildest cases of the latter. These sequelæ are always of an inflammatory character, and in severe cases the safety of the patient depends upon the promptitude and vigor with which depletion is practised. They most frequently occur, you will remember, between the 10th and 20th day from the development of the primary symptoms, and are all of them ushered in by loss of appetite, languor, and, in cases of children, fretfulness; and are generally excited, as you will remember, by errors in diet or exposure to vicissitudes of temperature, though they occur without such exciting cause with sufficient frequency to justify the suspicion that they are, in reality, dependent on the original influence of the miasm which gives rise to the disease of which they would then be merely the latter stage, rather than a sequela. They are all accompanied by a dry, heated, condition of the skin; a suspension or great diminution of the secretion from the kidneys; a tense and rapid pulse.

The endocardial inflammation, though not the most common, is the most formidable of these sequelæ, and may be recognized by the extreme rapidity of the pulse, the disposition to sigh, and especially the pain in the region of the heart. I have already indicated the plan of treatment which I think adapted to this case, when I alluded to it in the description of the disease. A decided and immediate impression should be produced by free venesection; a full dose of calomel should be given, followed by oil, or citrate of magnesia; a blister should be applied over the region of the heart; the diet should be restricted to barley or rice water; the most positive quiet should be maintained; and if the febrile reaction be not subdued by these means, and the strength of the patient admit it, leeches or cups should be applied between the lower angle of the scapula of the left side and the vertebræ.

Having by these means subdued the active phlogosis, the patient must be kept in a state of perfect tranquillity of mind and body, and on the most rigid diet, till all symptoms of active inflammation are subdued.

The dropsical effusion and the inflammation of the kidneys may be spoken of under one head, since they are at least intimately associated, and demand the same treatment, even if the former do not generally depend on the latter as the proximate cause, which I believe to be the true pathology of such cases. Where the affection is slight and the febrile reaction mild, a dose of calomel followed by a saline cathartic, will often suffice to subdue the inflammation and arrest the progress of the effusion. Should the skin continue dry and husky, the tongue coated, the pulse quick and corded, great advantage may be expected from the use of the solution of citrate of potash or the effervescing draught with sweet spirits of nitre; and these failing to give relief, the nitrate of potash with antimony and small doses of calomel may be resorted to. If the fever be high and constant, bleeding will be not only well born, but absolutely requisite. The blood drawn under these circumstances is always much cupped, and covered with a dense buffy coat, and the relief which follows the abstraction of it is very great; I have known the most urgent symptoms yield immediately. The first indication of improvement will be found in the restoration of the healthy action of the kidneys. Should this not take place very shortly, digitalis should be given.

The best form for exhibiting this remedy with reference to its diuretic effect, is, certainly, the infusion, made according to the prescription of Withering, except that sweet spirits of nitre may be substituted for the Tinct. Cinnamomi, with great advantage. You will find the mode of preparation given in the article on digitalis in the Dispensatory of Wood and Bache. The dose must of course be proportioned to the age of the patient. If there be much fever, and the urine be very scant and high colored with deposit of a brown flocculent matter, there can be no room to doubt the presence of active congestion or inflammation of the kidney, which will be best met by the application of leeches or cups to the loins. I have found the perseverance in nitre and diuretic remedies in these cases, without first removing the local

inflammation by blood-letting, to aggravate the sufferings of the patient without producing any increase of the secretion.

But of all the manifestations of disease which mark the progress of scarlet fever, none are so much to be dreaded as the cerebral affections which occur at the period now under consideration. By some authors we are taught that meningitis is suddenly developed and proves fatal, either by giving rise to serous effusion, or terminating in the secretion of pus, or lymph. I have never met with cases in which I had reason to suspect the results last mentioned. The serous effusion is comparatively of frequent occurrence, and is sometimes poured out so rapidly as to produce convulsions and death, before the proper means for relief could be applied. In other instances the effusion takes place more gradually, but with an equally fatal tendency.

Some years since, I was attending a young gentleman of about 15 years of age, who was apparently convalescent from a severe attack of simple scarlet fever. He was an only son, and the object of intense anxiety to his parents. My directions about diet and exposure were carried out with great care; and yet the fever, and suspension of secretion from the skin and kidneys, supervened at the end of the second week. I at once resorted to purgatives and nitrate of potash. On the third day I was summoned to see him lying entirely comatose, with slow pulse, dilated pupils and cool skin. There was no metastasis of the effusion to the brain, for his whole body was œdematous. Recognizing at once the urgency of the case, I tied up his arm and bled him largely, and then put him on the use of small doses of calomel and nitrate of potash, with the infusion of digitalis. At the end of forty-eight hours the kidneys resumed their natural action, and in less than a week the whole train of symptoms had disappeared. These cerebral symptoms depend on the effusion of fluid into the ventricles or at the base of the brain, rather than on any vascular congestion or inflammation of the membranes, and are consequent upon the same causes as those which give rise to the anasarca; and the bleeding acts by curing the condition of the kidneys upon which the whole series of symptoms depends, as well as by withdrawing a portion of the blood, rendered unhealthy by the retention of matters which should have been eliminated by the skin and kidneys.

The next most formidable of the sequelæ is the effusion into the cavity of the pleura, or the parenchyma of the lungs, giving rise to the most distressing orthopnœa. Depending on the same cause as the cerebral cases just noticed, it requires the same treatment which should be pursued with the same degree of energy.

I have never seen a case of dropsical effusion following scarlet fever, which was not materially aggravated by the resort to tonic or stimulating remedies. When the effusion, whether general or local, has been absorbed and discharged through the kidneys, but not till it has entirely disappeared, it will be proper to resort to the use of some mild tonic; small doses of quinine in the first instance, followed by some of the preparations of iron, with fresh air and a good diet. It must not, however, be forgotten, that the convalescence from these attacks is slow. And that it is even possible that many months may elapse before the patient is restored to a condition of entire health.

The Rheumatic Fever I have always found yield to properly graduated doses of Dover's powder, or morphia and sweet spirits of nitre. Should the pulse be tense and quick, and the suffering prolonged, bleeding would be appropriate in this case also.

Diarrhœa depends upon the irritation produced by the acrid matter swallowed from the throat, and is most likely to occur after very severe anginose or malignant cases. It is quite possible that ulceration of the mucous membrane may be thus induced, keeping up this unpleasant disease a long time, and retarding the restoration of the strength of the patient. Opiates and mild absorbent remedies are the agents upon which we must rely in such cases, and we shall generally find the disease yield to such applications. I have, however, known the irritation transmitted from the ulcerated membrane to the mesenteric glands, and the patient has died, worn out by profuse discharges and hectic fever, after weeks of suffering.



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